

THE READER

A REVIEW OF LITERATURE, SCIENCE, AND ART.

No. 195, Vol. VII.

Saturday, September 22, 1866.

PRICE
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CURRENT LITERATURE:—

The Lake Dwellings.
Epictetus.
Cæsar's Invasion of Britain.
New Poetry.
SHORT NOTICES.

CORRESPONDENCE:—

Belgian Bone Caves.
Celts in Ireland.
SCIENCE:—
British Association.
Meetings Next Week.
MISCELLANEA.

ROYAL SCHOOL of MINES, JERMYN STREET, LONDON.—The 10th Session will commence on MONDAY, the 1st OCTOBER. Prospectuses of the Course of Study may be had on Application to the Registrar.
TRENHAM REEKS, Registrar.

OWENS COLLEGE, MANCHESTER
(in connexion with the University of London). Session 1866-7. The SESSION will COMMENCE on Monday, the 1st of October, 1866, and terminate on Friday, the 21st June, 1867.

Principal—J. G. GREENWOOD, B.A.

Particulars of the Day and Evening Classes for the present Session will be found in Prospectuses, which may be obtained from Mr. Nicholson, the Registrar, at the College, Quay Street, Manchester. More detailed information as to courses of study, scholarships, prizes, and other matters in connexion with the College, is contained in the "Calendar," to be had (price 2s. 6d.) at the College, or from the publishers, Messrs. Sowter and Sons, St. Ann's Square; Mr. Cornish, bookseller to the College, 33 Piccadilly; and other booksellers.

Evening Classes are held for persons not attending the Day Classes.

A more full Advertisement will be found in the "Reader" of Saturday, the 15th inst.

The Principal will attend at the College for the purpose of admitting Day Students, on Wednesday, the 26th, Thursday, the 27th, and Friday, the 28th September, from eleven A.M. to two P.M.; and for the admission of new Evening Students on Monday and Tuesday, the 8th and 9th October next, from half-past six to nine P.M.

J. G. GREENWOOD, Principal.

JOHN P. ASTON, Secretary to the Trustees.

September, 1866.

DOVETON COLLEGE, CALCUTTA.—WANTED, for the School in connexion with the above:—

1. A HEAD-MASTER, to undertake the Superintendence of the School, Conduct the Mathematical Instruction, and Assist with the other Masters in House-duty. A University Man, English or Scotch, is required, not over 30, Married or Unmarried, and a Member of some Protestant Church. Salary, £360 a-year, with Quarters (Unfurnished), Board, and Medical attendance.—First-Class Passage Overland.

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4. A TRAINED MASTER to Conduct, with an Assistant, the Infant School, and to assist in House-duty; Married or Unmarried; otherwise as above. Salary, £180 to £240, with Board, &c., as above.

Testimonials of abilities and experience to be lodged with the Rev. James Currie, M.A., Principal of the Training College, Edinburgh, on or before 20th October; when the Electors will appoint immediately.

The Gentlemen selected will be required to leave this country on or about 19th November, and to engage for a period of not less than five years.

Edinburgh, 18th September, 1866.

LECTURES on MINERALOGY and GEOLOGY at KING'S COLLEGE, LONDON, are given on WEDNESDAY and FRIDAY MORNINGS, from Nine to Ten, by Professor TENNANT, F.R.S. Those on MINERALOGY begin on FRIDAY, OCTOBER 5, and terminate at Christmas. Fee, £2 2s. Those on GEOLOGY commence in JANUARY and continue till JUNE. A shorter Course of Lectures on MINERALOGY and GEOLOGY is delivered on WEDNESDAY EVENINGS, from Eight till Nine. These begin on the 10th of October and terminate at Easter. Fee, £1 11s. 6d. Mr. Tennant also accompanies his Students to the Public Museums, and to places of Geological interest in the country.

R. W. JELF, D.D., Principal.

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NATIONAL ASSOCIATION FOR THE PROMOTION OF SOCIAL SCIENCE.

THE TENTH ANNUAL MEETING

Will be held in

MANCHESTER,

From WEDNESDAY, the 3rd, to WEDNESDAY, the 10th of OCTOBER, 1866.

President.

The Right Hon. EARL of SHAFTESBURY, K.G.

President of the Council.

The Right Hon. LORD BROUGHAM.

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Foreign Secretary—JOHN WESTLAKE.

Local Secretaries—J. W. MACLURE, HERBERT PHILIPS, Rev. S. A. STEINTHAL.

ORDER OF PROCEEDINGS.

Wednesday, Oct. 3rd.—12.30 P.M., Council Meeting in the Barristers' Library, Assize Court; 3.30, Special Service in the Cathedral, Sermon by the Rev. Canon Richson; 7.30, INAUGURAL ADDRESS, by the EARL of SHAFTESBURY, K.G., in the Free Trade Hall.

Thursday.—10.0 A.M., Address from the President of the Council, Lord Brougham; 8.0 P.M., *Soirée* in the Assize Courts; 8.30 P.M., Address from David Dudley Field, Esq., on the New York Code in the Civil Court; and a Conference on Reformatory and Industrial Schools in the Criminal Court.

Friday.—10.0 A.M., Address from the President of the Jurisprudence Department, the Hon. George Denman, Q.C., M.P.; 8.0 P.M., Working Men's Meeting in the Free Trade Hall.

Saturday.—10.0 A.M., Address from the President of the Education Department, the Right Hon. H. Austin Bruce, M.P. Excursion to Sadden Bridge, near Whalley, on occasion of the Opening there of a new Co-operative Cotton Mill. Musical Promenade in the Botanical Gardens. 8.0 P.M., Opening of a New Branch of the Manchester Free Library.

Monday.—10.0 A.M., Address from the President of the Health Department, William Farr, Esq., M.D., F.R.S.; 8.0 P.M., *Soirée* in the Assize Courts.

Tuesday.—10.0 A.M., Address from the President of the Economy and Trade Department, Sir James Kay Shuttleworth, Bart.; 6.30 P.M., Banquet in the Central Hall of the Assize Courts.

Wednesday.—10.0 A.M., Council Meeting in the Barristers' Library; 1.0 P.M., Concluding Meeting of Members and Associates in the Civil Court.

Excursion to the Co-operative Establishment in Rochdale.

The Presidential Addresses will be given in the Civil Court.

The Departments will sit in the various Rooms assigned to them in the Assize Courts from 11.0 A.M. to 4.0 P.M. on the 4th, 5th, 8th, and 9th of October; and from 11.0 A.M. to 2 P.M. on Saturday, 6th.

TICKETS.—Members' Tickets admitting to the Annual Meeting, and entitling them to a copy of the "Transactions," £1 1s. Associates' Tickets, only admitting to the Annual Meeting, 10s. Transferable for Ladies only, 15s.

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by the Rev. W. CHALMERS, A.M.; and the Manuscript of the
Second Volume (see READER, Sept. 8th) specially revised by
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CURRENT LITERATURE.

THE LAKE DWELLINGS.

The Lake Dwellings of Switzerland and other Parts of Europe. By Dr. Ferdinand Keller, President of the Antiquarian Association of Zurich. Translated and Arranged by John Edward Lee, F.S.A., F.G.S. (London: Longmans.)

SINCE 1854, when Dr. Keller published his first report on pile-dwellings in Lake Zurich, he, and other Swiss Archaeologists stimulated by his example and guided by his counsel, have zealously explored many other Swiss lakes, and have succeeded in discovering more than two hundred similar settlements, and in collecting tens of thousands of relics of the people who during many centuries occupied them. Six reports on the "wonderful Pfahlbauten" have been published by Dr. Keller; but, being written in German, they are less known than the compilation in French by Fred Troyon, who has absorbed Dr. Keller's facts, and, mingling them with fancies of his own, has given a sensational character to his work. Excellent notices have, however, appeared, written by Wylie, Lubbock, Lyell, and others, and translations of some original memoirs have been printed in the Smithsonian Reports. Stripped though the subject be, in some degree, of novelty, the present translation of Dr. Keller's work is not the less welcome; it is indeed right, that he who gave the first exposition of these structures should tell the story of their discovery, and picture forth the state of society which their remains reveal. In this work we have a general description of the structure of these dwellings; notices of the various settlements which have been discovered, with an account of others on the Italian side of the Alps, and of the Crannoges in Ireland and Scotland; chapters on the remains of plants, by Dr. Heer, and of animals, by Professor Rüttimeyer; and ninety-nine plates and several woodcuts give graphic, but sometimes rough drawings of the dwellings, and of the various objects found in them. As a store-house of facts, illustrating the character and progress of an ancient people, this work is invaluable; it will aid other Archaeologists in their researches; and we think, too, that the cautious and philosophical manner in which Dr. Keller reasons from his facts will help to correct some hasty and fanciful speculations.

For the construction of pile-dwellings, the Swiss lakes afford favourable sites, as along the shores there is generally a considerable breadth of shallow water. Some pleasant bay, protected by well-wooded hills, abounding in game, was selected for such settlements; and at a little distance from the land piles of various kinds of wood, generally entire stems with their bark on, but sometimes split, and from fifteen to thirty feet in length and three to nine inches in diameter, were driven into the bottom of the lake, the heads of the piles rising from two to four feet above the water. At the Wangen settlement, there were 40,000 piles, but all may not have been driven down at the same period. Across this substructure, other stems of trees ten or twelve feet long were laid, and fastened by wooden pegs; and above them split boards were similarly fastened, forming a solid, even platform, which was covered by a bed of mud or loam. The platform of a few, which Dr. Keller calls *fascine dwellings*, was supported not on piles, but on layers of sticks and small stems built up from the bottom of the lake, being similar to some of the Scottish Crannoges. The boards and planks had been imperfectly fitted together, for numerous objects which had slipped through the chinks of the floor are scattered over the lake bottom; but quantities of broken implements, pottery, and animal and vegetable refuse, heaped together on particular spots, show that spaces

had been left in the platform, through which rubbish had been thrown into the water, thus forming heaps analogous to the kitchen-middings of Denmark. Huts were erected on the platform, having a framework of piles and stakes, with wattle or hurdlework of small branches woven between the upright piles, and covered over with a thickness of from two to three inches of loam or clay, evidence of which has been found in pieces of half burnt clay retaining the impression of the wattle-work. As some pieces have a curve, Troyon concluded that the huts were circular, and from nine to twelve feet in diameter; but Dr. Keller shows that the curve had probably been produced by the great heat to which the clay covering was exposed before it fell into the water, while also pieces of different curves are found promiscuously on the same spot with others perfectly flat, no piece indeed exceeding 12 inches across. It is now pretty certain that most, if not all the huts, were rectangular; those at Robenhausen and Niederwyl were found to be 27 feet by 22 feet. They stood close to but apart from each other, and were thatched with straw and reeds. From the almost universal prevalence of clay weights for weaving, it may be inferred, that every one was furnished with a loom. A narrow platform or bridge resting on piles, of which a few remains have been found, connected these dwellings with the land. Room enough there was in and around these huts for all the operations of daily life, as well as for the manufacture of every implement used in household economy; and in short this was the place where every craft or art known to the settlers was brought into play. Even domestic animals were stalled on the platform, as at Robenhausen the remains of the litter of these animals has been found.

Such sites for dwellings are not unknown to history. Hippocrates describes similar habitations, on the stagnant, quiet-flowing river Phasis in Armenia, and Herodotus others on Lake Prasias in Thrace. The Crannoges in Ireland were inhabited as recently as 1645, but rather as places of refuge; and at the present time there are analogous structures in the Eastern Archipelago. Security against the attack of enemies seems to have been the chief reason of selecting such peculiar sites for dwellings, at a period when society was in a divided state, and when war of tribe against tribe was frequent. Similar conditions were indicated by the numerous hill-forts of the ancient Britons, and even by the pele-towers of the border-land in mediæval times. From the great labour bestowed on the pile structures, and the vast number of instruments of all kinds found in the "relic bed" of the lakes, it is clear that they had not been temporary places of refuge, but permanent habitations, which had been occupied during many generations; and the relics, scattered abundantly beneath these pile-dwellings, furnish important evidence relating to different eras of civilization.

In a considerable number of these dwellings—thirty at least—no trace of metal has been discovered, the instruments having been made of stone, bone, and wood; in a much larger number bronze, without a trace of iron, has been found; and in a few, it is clear, that iron has been extensively used. The three ages of Stone, Bronze, and Iron are here established by better evidence than from any other groups of remains; for the great number and variety of relics, which these lake habitations have yielded, give a broad basis for true inductive reasoning on pre-historic conditions. Yet there is evidently no sudden break in these periods, such as would prove that superior and conquering races had introduced higher civilization. "It is very certain that, at least in Switzerland," says Dr. Keller, "there was no hard line of demarcation between the three periods, but that the new materials were spread abroad like any other article of trade, and that the more useful tools gradually superseded those of less value." We have here, therefore, *continuity* and *progress*; and it may be reasonably inferred, that the

advance in art from the use of stone to that of bronze, and then to iron, was made by the same race who originally took up their abode on these lakes; for during the long time the pile habitations were occupied, extending over several thousands of years, there was no essential change in the structure of the dwellings or in the mode of life. Doubtless, when these lake-dwellers first arrived in Switzerland, they had the germs of civilization; they had domestic animals from the first, such as sheep, though the flesh of wild animals was more used for food; they could spin, weave, and make cordage from bast or vegetable fibre, rude pottery they could make, some of which was even painted with graphite and rubble; fishers they were, using nets and hooks made of bone; from serpentine, flint, horns, and bones they made their weapons and tools; they had brought with them cereals, and cultivated the soil with very inefficient instruments made of stag's horns and crooked branches of trees, and raised wheat and barley, which they ground by mills of a primitive form, consisting of a round stone as a corn crusher, and a mealing stone with a hollow in which the corn was bruised. The stone weapons and implements are similar to those of Denmark; but several show in an interesting manner how the stone celts or chisels, which were small, from one to eight inches in length, were hafted. Some were first inserted into a piece of stag's horn, and then set in a shaft or club; others were inserted into clefts of branches and fastened by cord and asphalt. During this early age, it was the most important of all instruments, and was used for various purposes; fixed at the end of a pole, it was a lance; let into wood, it was a war-club or domestic axe; placed in horn, it was the poor man's knife; it served to skin animals, to cut flesh and hides, and to make all instruments of horn and wood.

The evidences of commercial intercourse with other people are but slight; but a blueish glass bead, in a Stone age dwelling on the little reedy or "moor lake" of Wauwyl, may show some connexion with the Egyptians or Phœnicians; and knives, arrow-heads, and other implements, made of flints, not found in Switzerland, but derived from distant parts of France and Germany, may indicate a barter trade with the North and West. Possibly, too, Nephrite, of which the most valuable celts were made, and which does not occur in Europe, but in Egypt, China, and other parts of Asia, may point to intercourse with the East, unless we suppose the Nephrite implements had been brought from the East by the lake-dwellers when they first settled in Switzerland.

Not a few of the Stone age dwellings had been burnt by accident or by an enemy, and were not rebuilt; but others had a continued existence through both the Stone and Bronze periods; and hence we see settlements in a transitional state, and trace a gradual advance in civilization. At Meilen, where a vast number of stone relics have been found, there appear one bronze armilla and one bronze celt; but at Robenhausen we probably see the commencement of the metallurgic art, for amid a profusion of stone relics belonging to three different platforms, crucibles have been found, with lumps of melted bronze, and one lump of pure unmelted copper. It may be that the lake-dwellers became first acquainted with metal through traders; but, as Dr. Keller remarks, "May we not venture to assume that the colonists, by their intercourse with strangers who were acquainted with the nature of metals, were incited to search their country for copper ore, and try to melt and cast it? Copper ore is found on the south side of Mütschenstock, on the Lake of Wallenstadt." The age which was dawning blends itself with the age which was setting; for we find that the new instruments of bronze were copies of the old forms in stone. Even the bronze ornaments were but improved copies of analogous objects in bone, showing indeed the sameness of race in both

periods, and the similarity of their tastes and customs. The gradual introduction of metal gave to the lake-dwellers new powers, which enabled them to improve their condition; dwellings were now erected in deeper water; larger piles were used, and better sharpened and squared, fastened with cross beams, and strengthened by stones heaped up; pottery was better made, more elegant in form, and sometimes painted black or red, or ornamented with tin-foil plates. The bronze implements which had been made by native artisans were of excellent workmanship and form, especially the spear and javelin heads, which prove great proficiency in casting. The swords with short handles and curved knives and armillæ resemble those which have been found in Denmark; but we observe none of the graceful leaf-shaped swords which occur in Britain and Ireland. Varied, peculiar, and sometimes beautiful is the ornamentation of the period, consisting of zigzag lines, points, triangles, spiral and lozenge forms.

A transitional state there was, too, between the Bronze and the Iron periods. Morges settlement on Lake Geneva may be regarded of the Bronze age; for not only have 130 bronze objects been found there, but also moulds for casting bronze winged celts, showing that such implements had been made on the spot; yet here there occurs an iron poniard. But in the lake-dwelling of Marin, one of the last occupied, the number of iron objects is surprisingly great, exhibiting to view weapons, agricultural and domestic implements, and ornaments made of iron, which in the older dwellings had been made of stone, or bone, or bronze. Of these iron relics the most remarkable are the swords, of which fifty and more have been found at Marin, some with and others without sheaths, all, with one exception, of iron, and every one being peculiarly yet differently ornamented. These swords are masterpieces of the smith's art, and were probably produced at large manufactories, when there were division of labour and every practical appliance, for some of them bear upon them makers' marks. They are, however, the product of Celtic art, and correspond in form and ornamentation with those of the later Celtic period of Northern nations; and this view is confirmed by the discovery of similar swords in the ditches of the fortress of Alesia, where a conflict had taken place between the Romans and Helvetians when it was besieged by Cæsar. Less striking to the eye, however, is the connexion between the productions of the Bronze and of the Iron Age; but our author remarks:—

There are, indeed, some forms of implements which remind us of the previous age. But, on the whole, when the Marin objects were made, iron had taken full possession of the field, and all the implements, including ornaments, which could be made out of iron, a metal both firmer and more pliable, were manufactured out of this material. But the form of these specimens had in some measure undergone a change, for the working of iron is a totally different matter from that of bronze; and the hammer of the smith and the moulds of the founder cannot produce the same forms. The remains of the settlements of pure Stone, Bronze, and Iron ages indicate, therefore, epochs of civilization amongst the inhabitants, separated by long intervals, while the end for which the lake-dwellings were erected—viz., the security of person and property—and their construction remained the same.

Of the religion of the lake-dwellers there is no certain information; but some relics made of stone and pottery, somewhat crescent-shaped, found in Bronze age settlements, Dr. Keller thinks may be representative of the crescent moon, and, therefore, probably objects of worship. According to Pliny, the Druids gathered the mistletoe with great solemnity on the sixth day of the moon; and hence it is inferred that the moon images were sacred emblems, having power to avert and cure diseases. This, however, is but a fancy, for it does not appear from Cæsar that the Celts worshipped the heavenly bodies.

The fauna and flora of the lake-dwellings afford interesting information to naturalists, and throw some light on the questions as to the origin, the development, and distribution of species. During the Stone age, the *Bos primigenius* and *Bos bison* were abundant, but they disappear after the introduction of metallic weapons; the former is now only found on the marshes of the North Sea. A very large ox, with great semilunar horns, bent forwards from the frontal plane (*Bos trochoceros*), and which had been contemporaneous with the Mammoth and Hippopotamus, appears to have been domesticated at Concise and Chevreaux. It is now extinct; but the Marsh cow (*Bos brachyceros*), which was most abundant in the Stone age, has continued to exist to the present time, and now occupies the mountainous parts of Switzerland and its wild mountain valleys. In the earlier periods, several races of swine ran wild, which were subsequently domesticated. The fox was abundantly eaten; but the hare was not used for food, even the traces of its existence are few; neither domestic fowls, nor rats, nor mice appear. Wild animals predominate in the Stone age, but they gave way in subsequent periods to domestic animals.

The seeds and other parts of plants, lying in the lake mud, or buried under several feet of peat, have been so well preserved, that their characters can be determined. The small-grained six-rowed Barley, and the small lake-dwelling Wheat (*Triticum vulgare antiquorum*), were, from the earliest period, the most generally cultivated of farinaceous seeds; and, notwithstanding the rudeness of the husbandry implements, the quality of the produce was apparently equal to that of modern times; the Spelt (*Triticum Spelta*), now one of the most important cereals of Switzerland, did not appear till the Bronze age; while rye was entirely unknown, thus showing a connexion with the countries of the Mediterranean, the lake colonists having the same cereals as the Egyptians. Cakes of unleavened bread have been found, made of millet and wheat, which had been baked on the hearth-stones in the dwellings. Barley seems to have been used boiled or parched; but as corn crushers and mealing stones have been found in most of the settlements, grain had been extensively used for food. The latest settlement, dating backward not less than 2,000 years, and the older going some 3,000 years and more further backward still, it is interesting to observe what change this long lapse of time produced on plants:—

The dense compact wheat and the close six-rowed barley have undergone no perceptible change, yet it must be confessed that most of them agree with no recent forms sufficiently to allow of their being classed together. The small Celtic beans, the peas, the small lake-dwelling barley, the Egyptian and small lake-dwelling wheat, and the two-rowed wheat, or *emmer*, form peculiar and apparently extinct races; they are distinguished for the most part from the modern cultivated kinds by smaller seeds. Man has, therefore, in course of time produced sorts which give a more abundant yield, and these have gradually supplanted the old varieties.

With wild plants the case is different:—

The flora of the lake-dwellings announces to us that all the plants which come in contact with man become changed up to a certain point, and man participates in the great transformations of nature, while the wild plants, which surround us at the present day, still grow in the same forms as they did three or four thousand years ago, and do not exhibit the slightest change.

The final abandonment of these lake-dwellings, about the beginning of the Christian era, would result from an improved civilization and a more united and orderly state of society; but how long before that time they had been occupied has not yet been definitely determined; our chronology is still relative rather than absolute. Peat has accumulated over some settlements, but as its rate of growth varies under different conditions, we are only told by it that the Stone age dwellings lasted many centuries. At

Robenhause peat moor, there are remains of three settlements of the Stone age, one over the other; two of which had been destroyed by fire, and the last had been abandoned, probably on account of the increase of peat. Between the first and second settlement there are three feet of peat and one foot of other deposit, both containing relics; between the second and third settlements the deposits are the same in character and thickness, and over the last dwelling are two feet of peat and half a-foot of mould; so that during the Stone age there had been a slow growth of eight feet of peat, and the deposit of three and a-half feet of other matter. Other means have been used to obtain more definite results; the most remarkable of which is that of Professor Morlot, who, from an examination of a cone of gravel and alluvium, connected with deposits of the Stone, Bronze, Roman, and recent periods, and gradually built up by the torrent of Teniere where it falls into Lake Geneva, concludes that the age of Bronze has an antiquity of from 3,000 to 4,000 years, and that of Stone from 5,000 to 7,000 years—no very startling estimate, when we remember the high antiquity which has been assigned to the drift and cave men.

Of the physical characters of the lake-dwellers, Dr. Keller gives us little information; that they had small hands is probable from the shortness of their sword-handles. Few human bones, and those chiefly of children, have been found. No crania of the Stone age have been seen, but a few out of the Bronze period, one of which from Meilen differs little from the skulls of the existing Swiss. It is, therefore, mainly from the relics found that we can form any guess as to the origin and relationship of the lake-dwellers, and by those it is shown that they belonged to the very people who at the same time lived on the mainland. Dr. Keller concludes "that the builders of the lake-dwellings were a branch of the Celtic population of Switzerland, but that the earlier settlements belong to the pre-historic period, and had already fallen into decay before the Celts took their place in the history of Europe."

The history of the lake-dwellers opens a hopeful prospect for those races who are now in a degraded condition; for here they start with a low degree of civilization, and yet there is a gradual rise upward to that point where great skill was reached in metallurgic and other arts; but even this was only a step onward to that high cultivation of intellect and morals among their descendants the Swiss people. Why should not other races pass through the same stages, especially when influenced by intercourse with modern civilized nations?

EPICETUS.

The Works of Epictetus: a Translation from the Greek, based on that of Elizabeth Carter. By T. W. Higginson. (Boston: Little and Brown.)

STOICISM has always been the most popular of philosophies. The names of its most celebrated professors are well-known, and have become favourite phrases with amateur moralists; its essential tenets are familiar to the common ear as household words; its doctrines, moreover, are really pretty well understood by those who have but the most hazy notions of the object and method of the other schools. There is nothing esoteric to be mastered; no mysterious symbols to be explained; acolytes are experts. So practical and practicable, indeed, are the principles of the school, and so clearly developed have they been, as well in the lives of eminent disciples as in their writings, that even the general reader, to whose happiness poring over the printed page has become a habit and a luxury as indispensable as tobacco or a House of Commons, will be found by accurate inquiry to be better acquainted with their tendency than he is with the aim and scope of any other philosophy, past or present. Stoicism is founded on a very pretentious theory of human life, and has consequently

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numbered amongst its followers such opposite characters as great orators, eminent Red Indians, effeminate Asiatic kings, and English Essayists. Men have even been Stoics unconsciously, and memory of them has been industriously kept alive in books and in speeches by admirers of the system. But it is the disciple by choice that is most honoured. Marcus Aurelius, who was a tip-top Stoic, is well known to have assumed the dress and gravity of the brotherhood when he was a precocious boy. His conjecture as to the benefits derivable from adhesion to the prescribed mode of life he had adopted was probably soon dissipated by experience; but he remained true to his profession, and undoubtedly did not desert the course he had entered upon. He was a Stoic to the last, and for his perseverance he has the applause of mankind. The list of its famous scholars is too long to enumerate here.

The special traits which have made the Stoics famous seem to us founded on an altogether wrong estimate of human nature and of its functions. We could never see merit in one enduring pain as if it were pleasure, nor appreciate the heroism of a man who, without necessity, voluntarily habituated himself to poverty and the miseries that accompany privation of the benefits and pleasures of civilization. If by abstaining from an exhibition of the pain one endures one were sure of relieving it, then would indifference be wise and admirable; but as the venting of emotion has by generations of experience been found to alleviate the intensity of suffering, a pretended disregard of human ills deserves the discredit that attaches to every other kind of hypocrisy. What can be more ludicrous and more deserving of laughter than the anecdote of Epictetus as preserved by Origen? The philosopher's leg was tortured by his master, whereupon our philosophic slave quietly contented himself with remarking, "You will break my leg;" and when his anticipation was presently fulfilled, he added, in the same tone, "Did I not tell you so?" Yet such behaviour has been admired and applauded by otherwise intelligent men. If, however, it is admitted that some credit is due to those who suppress the exhibition of natural instinct, what can be said in favour of men who spend their life in poverty and in voluntary seclusion from the happiness that may be within their reach, in order to prepare themselves for the contingent ills that may be in store for them? We know that an army is occasionally sent down to winter in miserable huts, that it may thereby be disabled by rheumatism and other distempers, so as to be enabled to bear, from custom, those ills if ever necessity should arise. But it is a Government and not a board of philosophers that gives the order. A Whig and a Stoic were never convertible terms.

But the reader has already asked *a propos* of what are these remarks? Let him know, then, although it is the big gooseberry season, that we have a reason for thus disposing of Stoicism and the Stoics. A Stoic has arisen in America; has written a book, or, at least, has re-translated an old book containing the famous precepts of the famous school; and, with all the authority derived from experience, has implicitly recommended for our adoption the discourses of Epictetus, that formed the favourite manual of Tous-saint l'Ouverture, and which our American scholar declares to be replete with high conceptions of the Deity.

Epictetus, as is well-known, was translated by Mrs. Elizabeth Carter, a lady whom Dr. Johnson declared to be the best Greek scholar in England of her day. That translation has hitherto held its ground, and has received so much praise that no other was undertaken. At length, however, the learned lady has a successor. Mr. Thomas Wentworth Higginson, a gentleman who has retired from the American army, has here given us, in amended form, the four books that remain of the Discourses, the

Enchiridion, and the extant Fragments of the maimed philosopher:—

I hesitated [he says] for some time, whether to call this book simply a revision of Elizabeth Carter's translation, or a new one based on hers. The latter alternative was finally chosen, less in order to claim for myself any credit of hers, than to save her from sharing any discredit of mine. The enterprise was begun simply as a revision. But to revise any translation made a century ago, is like under-running a telegraphic cable: one may inspect a good deal of it, and find but trifling repairs needful; and then one may come to a point where a wholly new piece must go in. These substitutions multiplied so rapidly, and even where the changes were slight they touched words and phrases so vital, that the name I have chosen is really the least dishonest that could be given.

We have examined the translation thus deferentially introduced to us with some care, and, although we have not compared it with its predecessor, we are able to state that, wherever we have placed the translation side by side with the original by Arrian, we find—although the style is altogether distinct as a corduroy road is from Bond Street—that the tone and spirit of the Greek has been admirably preserved. If for no other reason, the fact of a translation of such a work as the so-called remains of Epictetus by an American who has lately come from active military life is in itself remarkable. We willingly introduce it to the English public.

CÆSAR'S INVASION OF BRITAIN.

Julius Cæsar: Did he Cross the Channel? By the Rev. Scott F. Surtees, Rector of Sprotburgh, Yorkshire. Pp. 32. (John Russell Smith.)

THIS publication has been for some time upon our table; and the reason why we have delayed to notice it is that we really could not make up our minds whether the author seriously believed his own theory, or whether he was attempting a sly satire upon our antiquaries, who, no doubt, occasionally put forward somewhat wild hypotheses, and support them by still wilder reasoning. Upon the best consideration, however, that we can give to Mr. Surtees' book, we have come to the conclusion that he really means what he says; and we therefore proceed to lay before the reader a specimen of his lucubrations.

His theory is that Cæsar sailed, not, as commonly supposed, across the British Channel from some point between Boulogne and Calais to some point between Hythe and Deal, but over the high seas from the mouth of the Rhine, and that in his first expedition he landed at Cromer, in Norfolk, and in the second at Brancaster, in Norfolk.

What evil genius could have prompted Mr. Surtees to commit himself to so absurd a theory? Had he never heard of the adage, "Oh! that mine enemy had written a book!" or has he no enemies? A critic is a natural enemy; but we will deal as gently with him as justice will allow. The reader will, no doubt, ask, by what line of argument, however delusive, could anyone in his senses have been so misled? The *ignis fatuus* that has drawn him into the quagmire appears mainly to have been a misunderstanding of Strabo. "He [Strabo, or rather Mr. Surtees] informs us that those who sail from the mouths of the Rhine [the italics are the author's] sail from Itium, a port of the Morini, which the divine Cæsar used as a naval station when he crossed into Britain" (pp. 6, 7). As Mr. Surtees is evidently no scholar, we may assist his inquiries by translating the passage for him. It is literally this: "There are four lines of passage commonly used from the continent to the island that are from the mouths of rivers—viz., from the Rhine, and the Seine, and the Liger, and the Garonne. But to those who set sail from the parts about the Rhine, the passage is not from the embouchure itself, but from the Morini, who border upon the Menapii, amongst whom [the Morini] is also that Itium which Divus Cæsar used as a naval station when he crossed into

Britain." Strabo therefore states, as plainly as language can do, that those who sail from Itium do not sail from the mouths of the Rhine, but from the Morini. How astonished would Strabo have been to hear himself quoted as saying that "those who sail from the mouths of the Rhine sail from Itium!"

Mr. Surtees is embarrassed by the fact that Itium was a port of the Morini; for if Itium was at the mouth of the Rhine, the Morini were also at the mouth of the Rhine. And how does he deal with this obstacle? Why, he very coolly asserts that the Morini were seated about the Rhine, and would fain carry this point by a *coup de main*. "We are almost ashamed," he says, "of calling the attention of the student of history to the fact that the Morini and Menapii dwelt at or near the mouths of the Rhine or Scheldt" (p. 6). He ought to be not almost but altogether ashamed of such a perversion of ancient geography as to confound the Morini with the Menapii. His syllogism, when drawn out at length, would seem to be this: the Morini were bounded on the east by the Menapii, and the Menapii were bounded on the east by the Rhine; therefore the Morini were bounded by the Rhine!

It occurs to him, as it well might, that Cæsar speaks of his passage as one of thirty miles, whereas from the mouth of the Rhine to Norfolk was eighty or ninety miles. The way in which he grapples with this difficulty is quite marvellous—viz., that thirty miles of the coast have, since Cæsar's time, been swept away by the wash of the sea! (p. 13). But has he not the acuteness to see that this places him on the horns of a dilemma? for if thirty miles of the coast have disappeared, how could Cæsar have landed at Cromer, thirty miles from the seaboard? and if he had landed at Cromer, how could the passage have been thirty miles only? The author adds in the appendix (but without the smallest tittle of evidence in support of it) that Cæsar wrote "lxxx," and not "xxx," miles, and that the "l" has slipped through the fingers of the transcriber!

Mr. Surtees should at least when he wrote have had the "Commentaries" of Cæsar before him; but no such thing. He first dreams that Cæsar said so and so, and then builds a castle upon the dream. The reader may recollect that much controversy has been raised amongst antiquaries upon the statement of Cæsar, that on the fourth day after his arrival in Britain occurred the full moon, which, according to all calculations, was on the night of August 30, B.C. 55: "Post diem quartum," &c. Will it be believed that a person who affects to set other people right is so absolutely in the dark himself as to suppose that the "Commentaries" speak not of the fourth but of the sixth day? He seems even delighted with his own error, and calls our particular attention to it. "It is high tide, mark! at 3 o'clock on the 24th of August; six days after (August 30) it is full moon. Take your tidal tables, and calculate back six days from the full moon, and you will find not only that this must fix Cromer as the spot where Cæsar made the land, but that it could be no other place," &c. (p. 15). Now, the Latin idiom requires that "post diem quartum" should signify the fourth day, both extremes inclusive; so that if the full moon was on 30th August, Cæsar's arrival would be on 27th August. If one extreme be included, and the other excluded, the arrival would be on 26th August; and if both extremes be excluded, on 25th August. But by no possibility could the day of arrival have been 24th August.

The etymological argument of Mr. Surtees that Port Itium was at the mouth of the Rhine reminds us of the process by which schoolboys convert King Jeremiah into a cucumber. "Itium," says Mr. Surtees, "has another name: Ictium, Iccium, Ictov, Ictov. Is not this the port of the Ictii? Ictis was clearly situate in the German Ocean, one of the Ictipides, or Glessariæ, 'where amber is engendered,' over against Britain. Now turn to our dictionaries. Latin, glessum or gloesum, amber; French, ictère, jaundice;

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Greek, *κίτρινος*, yellow." And then he clenches the argument from his own personal observation: "We ourselves, when young, have searched for, and sometimes found, amber on the beach [At the mouth of the Rhine? No!] at Cromer!"

The landing-place of Cæsar on the second expedition was, according to Mr. Surtees, at Brancaster; and he seems seriously to believe that the Roman camp now existing there is the identical camp fortified by Cæsar. We are reluctant to disturb this pleasant reverie, but we must, for truth's sake, untie the bandage from Mr. Surtees' eyes. The camp at Brancaster is the ancient Branodunum, one of the entrenched camps erected by Theodosius, the father of the Emperor, to guard what was called the Saxonium Littus, and will be found noticed with the other camps for the like purpose in the *Notitia*, or military survey of the later Roman Empire.

We cannot compliment the writer upon his familiarity with history in other respects, for he stumbles in the orthography of the most well-known names. Thus, he speaks of "*Theodosius*," and "*Valentinian*," and "*Carusius*" (pp. 8, 9). And even his English is sometimes so ridiculously confused as to excite a smile. Thus, after arguing that Cæsar landed in Norfolk because the Romans ate oysters, and oysters are found on the Norfolk coast! he adds, in further proof to the same effect, that Roman remains are found abundantly all over the county—Roman pottery, Samian ware, "bones in heaps, in quantities sufficient to encourage an enterprising bone-man to collect them and sell them for manure! They were bones of different animals and teeth, principally horses and hogs, horns and teeth of oxen" (p. 24). This medley can only be paralleled by the oracular apophthegm of the old gentleman who said, "Nothing so much damages your coat as riding over an open heath in wet, windy weather—except perhaps your breeches!"

Our sober advice to Mr. Surtees, when about to write again upon an antiquarian subject, is the advice that was given by our facetious contemporary to persons about to marry—"Don't."

NEW POETRY.

The Dole of Malaga; an Episode of History Dramatized. By Digby P. Starkey. (Cassell, Petter, and Galpin.)

Thecla; a Drama. By Henry Bliss. (London and Edinburgh: Williams and Norgate.)

The Legend of the Mount; or the Days of Chivalry. By Alfred Elwes. (Erfingham Wilsen.)

Descriptive Poems, &c. By John Askham. (London: F. Warne and Co.; Northampton: Taylor and Son.)

Poems. By Magnolia. (Alfred W. Bennett.)

Lays of the Pious Minstrels. Eleventh Edition. Edited by Henry Wright. (Houlston and Wright.)

The Rock, and other Poems. (Longman, Green, Reader, and Dyer.)

A Waif on the Stream. By S. M. Butchers. (Trübner and Co.)

Alpha and Omega. By Merlyn Castell. (London: Simpkin, Marshall and Co.; Leicester: J. and T. Spencer.)

The Merry Bridal of Firthmains, &c. By James Smith. (Edinburgh: W. P. Nimmo.)

Bertha Devereux. (Richard Bentley.) &c., &c.

WE have here a batch of poetry truly appalling. Surely the poetic faculty must be wellnigh common to humanity. To us at present, however, its manifestations appear somewhat eccentric, and if not better employed, we might tabulate the ever-accumulating materials we possess in a form which would be instructive to ourselves and immensely interesting to those whose tastes are statistical. By their aid, too, some unpoetic soul, if indeed such remain, could perhaps throw a new light on the theory of epidemics, solar and lunar influences, and periodical diseases generally—that is, assuming the divine gift to be a mere mental malady. For ourselves we are not given to researches of this nature, and proceed to notice, in all

seriousness and humility, the effusions of the inspired multitude.

In the "*Dole of Malaga*" the reader will find a play representing one of those stirring incidents in Spanish history which Mr. Prescott recommended as a fit subject for the pen of the dramatist. This graphic writer had, however, himself so vividly described it, that further illustration seems scarcely needed. Mr. Starkey sets out with well-defined objects, and to a great extent attains them. Moor, Christian, and Jew he brings upon the scene, with individualities distinctly marked, and well sustained throughout. Kalifa, the wife of Omar, Captain-General of Malaga, daughter of a suspected, is, we think, the writer's most successful creation, but she is hardly one to create the intense passion with which the Moor is represented to be inspired. Mr. Starkey has written with great care, but he acknowledges that the structure, as well as the length of the play, unfits it for representation. We do not, however, think with him that he has therefore no excuse for publication. Unnecessarily extended as it is, we have read from the first to the last line with unabated pleasure—a pleasure which would have been enhanced had we observed fewer departures from the historic text. We find Mr. Starkey's name attached to the following in one of the magazines. It is not perfect, but there is sufficient to indicate that the poet might be more successful than the dramatist:—

Lo! Morning drops upon the dewy lawns
Like to a nymph who bounds into the ring,
Standing and gazing on the sleeping fawns;
One twilight moment balancing her spring
Between the day before, and night behind;
Between the shouting of the thousand sheaves,
Rustling a welcome in their rustic kind,
And the waste silence of the world she leaves.
Meantime a deepening blush outspreads upon
Her cheeks immortal; and that blush decides
The day for earth—letting the gods wait on,
Lorn of Aurora, till light's ebbing tides
Sweep her once more from the bereaved earth
Back to Olympian bowers and Maian mirth.

Mr. Bliss's "*Thecla*" is also an historical drama, but its treatment differs as widely from that of the preceding, as do the periods to which they respectively belong. From the times when the rule of the Moor in Catholic Spain was on the wane, we return to when Christianity was itself battling for a foothold in Rome. In this production we find little to admire. "The drama builds not well on hallowed ground," says the epilogue, a sentiment in which we fully concur; but it is not the nature of the subject to which we now object, although as a rule religious plays are exceedingly dull. The dramatic effect is entirely spoiled by the serio-comic jingle of the lines. The following will suffice to show how ill adapted is the metre selected to a dialogue where the tragic element should predominate. The words are spoken by Thecla to her rival, whose slaves are about to thrust the former into a dungeon:—

Nay—that exceeds your measure and your men's.
What! force? Help, Cæsar! Save me, citizens!
I'm bond no longer. By this ring! I'm free.
Lo, Cæsar's gift! who dares lay hands on me?
Aye, crouch and tremble, lest my cry reach him,
Whose wrath might make this cost you life or limb.
And know, proud woman, who it is you spurn!
There's something of the fates you've yet to learn.
You mean me harm. You menaced me this morning,
With, oh! what needs no magic for my warning;
Nor needs your soul be imaged more to see it;
Nor what my future, could your hate decree it.

And, again, Thecla addresses Nero in this wise with reference to St. Paul. We hardly believe Mr. Bliss intends to be serious:—

Ho! foul of heart, and hands of bloodshed full,
Your soot shall be as snow, your crimson wool;
Wash, or seek refuge under earth and sea,
For One is coming whom the hills shall flee.
A voice precedes; it echoes in these walls:
Hear and confess, 'tis Heaven's, and heard in Paul's.

And thus, virago-like, Thecla does the

Christian moralist to the end of the fifth act. What purpose Mr. Bliss has had in view in constructing this tragedy we confess we cannot discover; it may be, however, sufficient to quote another line from his epilogue—that he "takes some part in *Providence Divine*." We can only hope that the power of which the author claims to form a part is distinct from that influence usually associated with the words we have italicized, or we poor mortals might indeed dread our fate.

The little prose-poem, entitled "*The Legend of the Mount*," is written in the peculiar style adopted by Mr. Elwes in his "*Janfry the Knight*," which was rendered additionally attractive by the pencil of Gustave Doré. The present volume appears with but a single illustration. The simple story of the days of chivalry is charmingly told, and will be eagerly read by the young readers for whom it is intended. They will hardly stop to guess how much of the charm is wrought by the metrical art so skilfully employed by the writer. Mr. Elwes professes to have selected a course midway between poetry and prose. We think he has taken, perhaps unknown to himself, the former path, and we would earnestly recommend him to keep to it.

The author of "*Descriptive Poems*" has previously published a collection of sonnets, of which we were not much enamoured. Both volumes have been issued by subscription, his subscribers being chiefly of his own neighbourhood. This encouragement does honour, we venture to think, both to the poet and his friends, and partakes of none of the offensiveness of the literary patronage of earlier times. The sonnets were written when Mr. Askham was following the humble calling of a shoemaker; the present volume has been produced under far less favourable circumstances, the writer having of late been employed—we trust to his pecuniary benefit—in a large manufactory, where the constant din and bustle must have proved anything but conducive to the successful exercise of the gift of song, while the dwelling, if he has truthfully described it, to which he turns his steps after the day's toil is done, is not quite the spot we are prone to picture as the home of a poet. In the verses "*My Home*," he says:—

A cottage, humblest of its kind,
In a straitened thoroughfare,
With walls before, and walls behind;
And narrow slips of sunshine find
Infrequent access there.
The tardy morning slowly crawls
Into the narrow lane;
With a belated look it falls
Upon the sombre sullen walls,
And dies in gloom again.

We cannot give unqualified praise to the poems, but in them all there is much of real happiness, and a simple and genuine love of nature. At times they acquire a certain pathos, to hazard a paradox, in virtue of their very defects. Familiar subjects are chosen, are treated briefly, and it behoves us to add there will be found in the book none of the cant of the workshop, by which we mean that laudation of muscular toil, to the exclusion of all other, which is the staple of so many of the "songs of labour." We recommend Mr. Askham, before he re-issues his poems, to remove a few grammatical inaccuracies, and to omit the sonnets altogether, in a style of composition in which we are not surprised to find he does not at all times excel. So revised, the book should occupy an honourable position, if not amongst our standard minstrelsy, at least like the poems of John Clare, another Northamptonshire poet, among the curiosities of English literature.

Printed in clear type, on toned paper, and neatly bound, "*Poems by Magnolia*" are highly attractive. But externals are deceptive, urges Magnolia, in the following lines, which we quote entire:—

One day, on a fruit tree, I spied
Two apricots under the leaves:

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This one is a beauty, I cried,
Or wondrously now it deceives.
Soon the red one I pluck'd as I prais'd
And looked on its soft glowing skin :
To my lips for a moment I raised,
Then said, I'll first look me within.
When lo ! to my horror I found
A great insect asleep in the core ;
Disgusted, I stamped on the ground
What I gathered a moment before.
Then the one I despised once I took,
And I found it as sweet as could be :
On the outside 'tis folly to look,
Learn this sensible lesson from me.

Perhaps those who open this pretty volume may be less persevering than the fruit-gatherer, and be quite content with one disappointment. To Magnolia, however, we say, make another attempt and you may succeed.

The "Lays of the Pious Minstrels" has reached its eleventh thousand, a success which does not often follow the publication of a collection of sacred poetry. In the present edition the editor has added many original pieces, and has excluded others that were less exceptional, while in almost every case does he give the name of the author. This was not done in previous editions.

The bard who omits to prefix his name to "The Rock, and other Poems," has instead of a preface inserted a quotation from Shelly, to the effect that, "whatever talents a person may possess to amuse and instruct others, be they ever so inconsiderable, he is yet bound to exert them. If his attempt be ineffectual, let the punishment of an unaccomplished purpose be sufficient." To one so sensitive as the author of "The Cloud," the punishment of failure would indeed be more than sufficient ; but there are those who are totally unable to judge of the fitness to undertake what they attempt, and such persons are usually the last to discover when they have failed. "The Rock" is evidently the pet offspring of the poet's brain, but, to our thinking, is the least commendable in the volume. It is an attempt at gorgeous word-painting and nothing more. In the "Two Bees" and the "Dragon-fly," there is so much of genuine humour that they remind us of the more successful efforts of Mary Howitt. In a different strain there is "The Picture of a Kneeling Woman," very carefully written. "A Sketch by Raphael," too, is, in its way, charming. The poet has a liking for art subjects. We find "The Statue," "A Picture," "On a Picture by Titian," "On a Statue of Venus," "On a Picture" again. There is more variety, flexibility, and precision in this first attempt, as we judge it, than is usual in such cases, and the faults are those of an unpractised hand, rather than of incapacity.

"A Waif on the Stream" contains little worthy of note beyond "The Letters" and "Remembrances." In the first of these there is that which should make the writer dissatisfied with all he has produced besides.

"Alpha and Omega" is a production which must have served to amuse the leisure of Mr. Castell, who has written a faultless theological essay in faultless verse. It is tedious reading nevertheless, and we cannot recommend it. Not so the "Merry Bridal o'Firthmains," by James Smith, a Scottish bard, with whom our readers have doubtless already made acquaintance, his verses having been very freely admitted into the columns of the periodical press. "Bertha Devreux, an Incident in the Wars of the Roses," will neither interest nor amuse the reader, who, should he encounter "The Plague of Athens" or "Salus"—the latter another sermon in verse—may omit to read them without sustaining loss.

A Winter in Paris. By Frederick Simms, M.B. (John Churchill and Sons).—Should any of our lady readers purchase this work with the idea that from its title they may gain some notion of Parisian fashions and customs, they will be most woefully mistaken. It consists of a very curt description of the various

hospitals of Paris and its environs, very much after the style of the "Guide to the Tower of London," and others similar exhibitions. Although, as our author mentions in his preface, "comparatively little is known of French medical and sanitary matters in this country," we greatly fear that this work will add but very little to our stock of knowledge on the subject. Dr. Simms shows capabilities for better work, and we think, in his desire to be brief, he has deprived his book of its power for being useful.

Bleeding, and Change of Type in Diseases. By W. O. Markham, M.D., F.R.C.P. (John Churchill and Sons).—These "Gulstonian Lectures," though read before, and consequently indited for the benefit of, that deeply-learned body, "The Fellows of the College of Physicians," contain matter of much interest to lay readers—one of the subjects of debate especially so. Why our forefathers—nay, our fathers, indeed—should have been bled to the immense extent they were, and not merely survived such treatment but lived to good old age through it, whilst in the present day a similar course is all but fatal in the great majority of cases ; quite so in many—poor Cavour for instance—why this should be, we outsiders are at a loss to know. Some members of the profession holding in their ranks the names of Watson, Alison, Stokes, &c. (more than one of whom have since recanted this heresy), propounded, a few years since, an apparently feasible theory to account for this. They told us that "diseases had changed in their type." Here, then, was the mystery solved. But alas ! our author knocks on the head even this modicum of comfort, and in evidence, puts in a letter from Sir T. Watson, dated April, 1866, recalling his former opinion. We would fall back, then, upon the hope that the present line of treatment must be best, and that the experience of this generation of doctors has led them to throw aside the ever-ready lancet of their predecessors. What says Dr. Markham ? He cuts away even this thread of hope, by telling us "that it is most difficult to extract the right conclusion from the lessons of experience, and that, in fact, theory has never been so fertile a breeder of errors in medicine as this so highly-extolled experience." Physicians may be treating us wrongly even in the present day, then. Whilst, however, we read in this work that, amongst a generation barely passed away, persons have been bled to the extent of 80 and 120 oz. in one day ; of a lady under the care of a noted physician, in 1836, being bled fifty-eight times ; surely our present state of darkness is preferable to the past, even if right. We recommend the book to the perusal of all who feel any interest in the subject. The language is simple yet elegant, and the style worthy of the author and the subject.

The Synopsis of Heraldry ; or, a Short and Easy Method of Acquiring the Art of Blazon. By C. N. Elvin, M.A. (Hardwicke).—Though it must be confessed that in many respects heraldry is an extinct science, still a knowledge of its principles is as necessary to the antiquarian and the domestic historian as a knowledge of the feudal system is to the legal student. And so long as this continues to be the case, short grammars of heraldry will have their value. Mr. Elvin is no novice in the subject. His method, like his type, is clear ; his indexes full ; and the plates are well selected.

PUBLICATIONS OF THE WEEK.

- ARMSTRONG (R. and T.). Poetical Readings and Recitations, with Introductory Exercises in Modulation. Fesp. 8vo, pp. 96. Laurie (Edinburgh). 1s.
- AUNT LOUISA'S Sunday Books. With Coloured Illustrations. 4to, sd. Warne, each 1s. Joseph and his Brethren ; Story of King David ; Wonders of Providence.
- AUNT MARY'S Illustrated Reading Book. Cr. 8vo, sd. Routledge. 1s.
- BAILEY (W.). Angler's Instructor. 2nd Edition. Fesp. 8vo. Forman (Nottingham). Longmans. 1s. 6d.
- BAXTER (Rev. M.). Coming Wonders Expected between 1867 and 1875. With 15 Illustrations. Sm. cr. 8vo, pp. 447. Partridge. 2s. 6d.
- BELL (Catherine D.). Aunt Ailie ; or, Patience and its Reward. New Edition. With Illustrations. Fesp. 8vo, pp. 412. Warne. 3s. 6d.
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- CHRONICLES and Memorials of Great Britain and Ireland. Annals Monastical. Vol. 3. Edited by H. R. Luard. Roy. 8vo. Longmans. 10s.
- DALGLEISH (Walter Scott, M.A.). Progressive English Grammar, with Exercises. 12mo, pp. 152. Oliver and Boyd (Edinburgh). Simpkin. 2s.
- DALTON (Rev. E.). The Sea, The Railway Journey, and other Poems. 2nd Edition. Fesp. 8vo. Dalton and Lacy. 6s.
- DEFENCE of Church Principles. 12mo, packet. Moubray (Oxford). 1s.

- DISRAELI (Isaac). Curiosities of Literature. New Edition Edited, with Memoir and Notes, by his Son, the Right Hon. B. Disraeli, M.P. (In 3 Vols.) Vol. 3. Cr. 8vo, pp. 549. Warne. 4s. Complete, 3 Vols., 12s.
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- GAILLARD (J.). French Orthoëpy ; or, the Certain Guide to an Accurate French Pronunciation, being an entire Novel, Easy, and Systematic Method of acquiring a Pure French Accent, based on the Natural Action of the Organs of the Human Voice. Cr. 8vo, pp. 172. Philip. 3s. 6d.
- HARLEY (George, M.D., F.R.S.). Diabetes : its Various Forms and Different Treatments. Post 8vo, pp. vi.—74. Walton. 2s. 6d.
- JACOBSON (Dr. J.). Revelations of a Police-Court Interpreter. 12mo. Long (Hull) ; Whittaker. 5s.
- KINGSLEY (Henry). Hillyars and the Burtons ; a Story of Two Families. New Edition. 3 Vols. in 1. Post 8vo. Macmillan. 6s.
- LOVER (Samuel). Legends and Stories of Ireland. 8th Edition. (Select Library of Fiction.) 12mo, bds. Chapman and Hall. 2s.
- MARRYAT (Florence). For Ever and Ever : A Drama of Life. 3 Vols. Post 8vo, pp. 938. Bentley. 31s. 6d.
- MAURY (M. F.). Physical Geography of the Sea, &c. 12th Edition. Cr. 8vo. Low. 5s.
- METCALFE (J. J.). Reformation Resuscitated, the Church of Christ Described, the Church of England Reformed. 8vo, sd. Freeman. 2s.
- MILTON'S Paradise Lost. With Illustrations by Gustave Doré. Folio. Cassell. 5l.
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- Manuel de la Littérature Française à l'usage des Ecoles ; Contenant la Biographie Succincte des Principaux Auteurs des 16e, 17e, 18e, et 19e Siècles, avec la Nomenclature de leurs Œuvres. Fesp. 8vo, cl. 1p., pp. vii.—102. Seton and Mackenzie (Edinburgh). 2s.
- RIVER-REDS (Poems). Fesp. 8vo. Masters. 2s. 6d.
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- STORY of Abraham (The). Roy. 16mo, sd. Tegg. 6d.
- the Deluge (The). Roy. 16mo, sd. Tegg. 6d.
- SUNDAY Magazine (The), for 1866. Edited by Thomas Guthrie, D.D. Illustrated. Roy. 8vo, pp. vi.—854. Strahan. 8s. 6d.
- TAYLOR (W. Cooke, LL.D., M.R.A.S.). Student's Manual of Modern History ; containing the Rise and Progress of the Principal European Nations ; their Political History and the Changes in their Local Condition, with a History of the Colonies founded by Europeans. New Edition, carefully Revised and Edited by Charles Duke Yonge. Post 8vo, pp. x.—612. Longmans. 7s. 6d.
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CORRESPONDENCE.

CELTS IN IRELAND.

To the Editor of THE READER.

Sir,—The letter of "G. H. K." under this heading requires a reply from me. Far be it from me to defend the ethnological vagaries of the *Times*, but I must say a few words in explanation and defence of my Nottingham paper.

The report of it in THE READER necessarily mentioned only a few of its salient points. If "G. H. K." will kindly favour me with his address, he shall have an opportunity of reading it in *extenso* when published. I think he will then be convinced, not only that I never asserted the purity of the Celts of Connaught, but that his own way of stating the case is equally erroneous with that which he attributes to me. I agree with him in believing Donegal and Kerry to be as Celtic as Connaught, or more so ;

but the extension of English colonization in Tipperary and Limerick, renders Munster on the whole more Saxon than Connaught is. On the recruiting registers I find that in Connaught names of the O'Flaherty-M'Dermot-Daly-type are greatly more numerous than those of the Burkes, Joyces, and their congeners. And if "G. H. K." will oblige me by walking through Oughterard (as I have done myself), and noting down all the names over the shopdoors, &c., I doubt whether even there he will not find more native than foreign patronymics; while the peasantry are, I believe, yet more Celtic than the shopkeepers. "G. H. K.'s" mistake arises, I suppose, from his having confined his attention to the landed and professional classes, who are, doubtless, in the main, of foreign extraction.—Yours, &c.,

JOHN BEDDOE, M.D.

Clifton, September 19, 1866.

To the Editor of THE READER.

Sir,—The letter of your correspondent, "G. H. K.," in last week's READER, while right in the main, is based on erroneous notions, and likely to lead more "Sassanachs" into misconceptions.

I agree with him that the true Celts are not to be found so much in Connaught as in the south-western highlands (and some other remote parts) of Ireland; but he is greatly mistaken in assigning preponderance of Anglo-Norman and English blood to the people of that province. Such a statement would quite surprise any Irishman who pretends to a knowledge of the history of his country, and I should have thought that it would have passed unquestioned that the province of Connaught had been the least affected in this respect by the raids of Anglo-Norman fillibusterers, and subsequent English subjugation, seeing it was only in comparatively recent times that Connaught was brought under English rule and English influence, and that afterwards it was specially exempted from the edicts of confiscation, banishment, and similar Anglicizing processes carried out with the utmost rigour in the other three provinces of Ireland. "To hell or to Connaught" (a familiar phrase in some parts of Ireland even at the present day) were the alternatives given on more than one occasion to the native Irish of Ulster, Munster, and Leinster. In fact, Connaught was recognized as a sort of penal settlement for the troublesome Irishry of the rest of the island who resisted English progress and kicked against English rule. Mr. Prendergast's recent book shows how literally this was the case at the period of the Cromwellian invasion, and how the native Irish were driven by tens of thousands across the Shannon into Connaught. The tenacity of the Irish language in the province is also, surely, strong evidence against the Anglo theory of "G. H. K." Connaught was the last to accept the English tongue; and I believe it is now the only part of Ireland in which people can be found who are unable to speak English. In short, Connaught always has been, and still is, Irish of Ireland.

But, it may be asked, If Connaught men are not pure Celts and not mixed Angles and Celts, what are they? In the first place, I would call attention to the fact that Connaught is to the rest of Ireland that which Ireland is to England. Any tremendous bull or laughable confusion of words or ideas, which in England we put down at once to "an Irishman," passes current in Ireland as pertaining to Connaught men. In this and other respects, it is possible to find traces of an original antagonism, and a former distinction of nationality, between the Milesian Celt and the Connaught man. There are also some very marked physical, mental, and social differences between the two, in spite of the large voluntary or enforced migration of Milesians into Connaught, and the consequent intermingling of blood. The "proud Milesian" is tall and well developed, with a full, quick eye, an open countenance, and every inch a gentleman and a soldier. The Connaught man is, on the contrary, rather undersized, patient and submissive, and with little spirit, and "no fight" in him. He will suffer almost any privations to be able to scrape together a few shillings to hide away in the thatch of his cabin; while, on the other hand, openness of heart, purse, and house (to a ruinous extent), are the unfortunate characteristics of the true Milesian. These, as well as the general contempt with which Connaught men are regarded by the rest of Ireland, point, it seems to me, to a wide original difference of race—a belief which is confirmed by reference to the

very remote and half-fabulous records of Ireland. In these narratives—however widely they differ in other respects—there is a common agreement on the one point, which is, that there were pre-Milesian inhabitants in the island, with whom the Milesian invaders had to fight before they secured their position in the country. Those aboriginal Irish are known as Firbolgs, and some singular magical powers are attributed to them. Here, I believe, we find the key to the difference between the Connaught man and the man of one of the other provinces, and to the contempt in which the former is held by the latter. The descendants of the Firbolgs, greatly mixed it is true, are to be found in the Connaught men of the present day. They are perhaps rather more Irish, i.e., Milesian, than the Welsh and English, or the Breton French, but they are, nevertheless, a distinct, and undoubtedly a non-Celtic race. It is not unlikely that they belong to the pre-Celtic races, which connect the Cave-dwellers of pre-historic Europe with the present inhabitants of the Continent, and of whom the modern Lapp is the last pure remnant. It may just be observed, though it is a matter of no great weight, that lowness of stature is characteristic of both Firbolgs and Lapps, and that the practice of magic was attributed to both.—I am, &c., O.

BELGIAN BONE CAVES.

To the Editor of THE READER.

Sir,—*Qui s'excuse s'accuse.* Messrs. Symonds and Guise, after taunting me with the use of "insolent epithets" and with want of "manliness," inform the public that they went to the Lesse valley with a certain "express intention" of finding out all they could, accepting the friendly guidance of Dr. Dupont, and then publishing all they could. I accept the statement of Messrs. Symonds and Guise, that M. Dupont "made no secret of his views" concerning the Lesse valley caves, as founded on anything they may like—excepting truth. I should be curious to know whether M. Dupont, the discoverer of the caves, views the publication of a memoir in advance of his own proper results, comparing the Lesse valley phenomena with those of other drifts or river-beds, as carrying out the understanding which prevailed between himself and the English gentlemen who visited the caves, that nothing relating to the geology should be published until M. Dupont should himself have published his detailed report on the subject. I say distinctly that it would have been well if Messrs. Symonds and Guise had waited until all the facts had been before them, instead of importing an excitable element into the controversy by the introduction of new views, "certainly not those expressed by Dr. Dupont"—before Dr. Dupont has himself had the opportunity of publishing his own views.

An eminent British geologist writes to me: "I must premise my answer to yours received this morning by the observation that the members of our party came to an understanding that in anything we might publish as the result of our Belgian trip we would avoid all comment on the 'report' and verbal explanations offered by MM. Van Beneden and Dupont." This conduct is an example which it would have been better if Messrs. Symonds and Guise had followed.

How M. Dupont likes their conduct, the following extract of a letter recently received from him will show:—

Dinant, le 2me Septembre, 1866.

"Mon cher ami,—Je reviens précisément de la Suisse au moment où votre lettre me parvient. Ne pourriez-vous me procurer l'article de ces Symonds et Guise? Sinon, m'en faire une analyse? Ces deux porte-faux sont venus cet été avec MM. Jones et Dumon. Je vais avertir Sir C. Lyell et Prestwich de leur acte déloyal...—Votre dévoué, E. D."

I have no wish to enter into any dispute with Mr. Symonds. I shall be happy after November to enter in my own name into full and entire explanation about the Lesse valley Bone Caves.

You, Mr. Editor, are the custodian of the "laws of honour" in THE READER. I certainly shall not so far imitate the example of the "Gloucester excursionists" as to dictate to you whether your correspondents shall write in your pages under "pseudonyms," initials, or their own names. If, however, your interpretation of the "laws of honour" think it necessary, I am, yours truly,

C. CARTER BLAKE.

SCIENCE.

BRITISH ASSOCIATION.

Report on Oyster Cultivation.*

The author confined his remarks principally to the history of the living spat of the oyster, the chemical analysis of the meat and the mother-liquor of the oyster, to the adhesions of the various substances to which they loved to adhere, and to the marketable value of the oysters as tested by weight. He described the exceedingly interesting action and movements displayed by the young oyster when first emitted from its mother's shell, giving the reason why they sometimes floated on the surface of the water, and sometimes sank to the bottom, the use to which the young oyster places its cilia, expressing it as his opinion that these organs never dropped off, but were absorbed after the young oyster became fixed. He then exhibited a great variety of substances to which oysters seem to have a natural preference for adhering. Among these were several curiosities, such as a "plague pipe," to which an oyster had fixed itself; an ordinary pipe, presented to him by Sir Walter Trevelyan, in the bowl of which no less than three oysters had taken up their position; also some old-fashioned wine or spirit bottles, from the North Sea and Loch Ryan, presented by Sir William Wallace. He then described the result of the chemical analysis which he had instituted in conjunction with A. Pythian Turner, Esq., giving the amounts of mineral matter, the animal, and also the fatty matter. The results obtained showed that the phosphates were more important in the composition of the meat of the oyster than any other of the ingredients, and hence their great practical use for invalids and in sea-sickness. He also gave practical deductions as to choice of proper places where oysters should be laid in order to obtain a good supply of these phosphates. He then described the process of the growth of the oyster-shell, and the manner in which the oyster formed the shell from the mother-liquor, the mode also by which the little oysters were enabled to form their shell inside the mother shell. He had collected samples of oysters from almost every part of the United Kingdom. These have been accurately weighed, and he gave a table showing the relative value (commercially speaking) of oysters from oyster-beds, or proposed oyster-beds, of England, Ireland, Scotland, and Wales. He stated that he was still carrying on his experiments at Herne Bay; and that the French system of oyster-culture had been successfully carried out in a creek near Havant, not far from Portsmouth. He had at this moment one set of specimens at the Fish-Culture Exhibition at Arcachon, in the south, and another at a similar exhibition at Boulogne, in the north of France, as well as his own collection at the Horticultural Gardens, South Kensington, where he trusted to make a complete series illustrative of the culture of oysters, as well as that of salmon.

Report of the Committee of the British Association on the Mural Standard.†

The Committee of the British Association, soon after its appointment, thought it desirable to apply for advice and assistance to the Chemical Society, which includes many of the most eminent chemists and metallurgists in the kingdom. Their application was granted in the kindest manner by the President of the Society, Dr. William Allen Miller, the Secretary, Dr. Odling, and the other members of the Council. The subject was brought before the Society at two of its meetings, and the result was a very important change in the course of proceeding. Professor Frankland advised, that instead of Baily's metal, or any other metallic substance, either simple or compound, the Mural Standard should be made of white glazed porcelain. The question was carefully considered, more especially in regard to the durability of porcelain, and its susceptibility of changes by expansion and contraction. With regard to durability, we know, from innumerable examples, that porcelain will last for hundreds of years without any perceptible decay. We also know that it is very little subject to expansion and contraction from the changes of atmospheric temperature. But it is also well known that all objects made of clay contract by exposure to great heat. How could we pass our porcelain standard through the ordeal of a furnace without destroying the dimensions marked upon it? In this difficulty we were fortunate in obtaining the assistance of Mr. Casella, philosophical instrument

* This Report was read by Mr. F. Buckland in Section D.

† This Report was read by Mr. James Yates, F.R.S., in Section F.

maker to the Board of Ordnance. This gentleman, whose business makes him familiar with works of this particular description, instituted a series of experiments, which proved that a slab of porcelain after completion contracts visibly on its re-exposure to a great heat, but that, if the heat be sufficiently intense and sufficiently long continued, an adequate security will be obtained against future change. Consequently a slab may be prepared by firing at first, and then have the lines etched in with hydrofluoric acid, the figures and letters painted with enamel, the lines rubbed in with the same, and then the lines, figures, and letters all burnt in, after which treatment it will not shrink at all. Having obtained so satisfactory a result, the Committee desired Mr. Casella to proceed with his work. The Committee have seen no reason to make any important change in the form and dimensions of the instrument. These remain nearly as they were shown to the Statistical Section of the British Association at Birmingham. But, as the yard was then placed in close contact with the metre, a question arose whether the two measures might not be more clearly distinguished from each other, and to effect this it was proposed that the yard should be marked in red lines and the metre in blue. This suggestion was adopted, and the instrument, thus completed, is thought to be elegant and attractive, as well as clear and distinct. If, however, any persons prefer having it marked with black lines, this may be done. It was requisite that the divisions should be so exact, that no inaccuracy could be perceived either by the sight or the touch. This has been accomplished by our artist, who obtained from M. Perreaux, of Paris, one of his beautiful dividing instruments, which is so constructed as to divide, if required, to the 500th part of a millimetre, a length far more diminutive than can ever be found necessary. About the tenth of a millimetre is sufficient to answer every useful purpose. Besides showing the name of the maker on each instrument as a voucher for its accuracy, the Committee hope to obtain the stamp of the Government as directed by Act of Parliament. But, as the stamp could not be impressed on the porcelain, a number will be marked and burnt on every instrument, and the same number with the Government stamp will be impressed on the frame. The price cannot be at present determined. We can only say that it will not exceed 5*l.* 5*s.* When the demand is sufficient, the price may be lowered. A resolution has been unanimously adopted by the magistrates at Exeter in quarter sessions to obtain one of our standards for the county of Devon. The resolution passed to this effect was proposed by Sir John Bowring and seconded by Earl Fortescue. Whilst Mr. Casella has been employed upon our Mural Standard, a Birmingham artist, Mr. Gargory, who pursues the same line of business, has produced an instrument, which may be called a school metre, being especially adapted for school use. It is made of wood and ivory. It shows the metre together with the yard, both long and cloth measure, the principles of its construction being generally the same with those of the Mural Standard. Its price is about 7*s.* The sum of 50*l.* voted by the British Association at Birmingham having been expended, it will be necessary to ask for a further grant. If the General Committee of the Association should think it proper to send copies of the Mural Standard to all the places where the Association has met, or even to a considerable number of them, a grant of 100*l.* will not be too much; and it may be deserving of consideration, that if philosophers, who are proverbially poor, can afford such a sum as 100*l.*, the Lords of Her Majesty's Treasury, who have hitherto expended nothing on this great and indispensable public provision, need not grudge any amount which may be found requisite.

Report on the Extinct Birds of the Mascarene Islands.*

The Committee appointed by the British Association at Birmingham, September, 1865, for the purpose of assisting Mr. E. Newton in his researches for the remains of the extinct Didine Birds of the Mascarene Islands have the honour to report as follows: Almost immediately after the appointment of the Committee, intelligence was received in England of the very important discovery by Mr. G. Clark, of Mahebourg, in Mauritius, of a large deposit of bones of the true Dodo (*Didus ineptus*, L.) in a marsh known as the "Mareaux Songes," an account of which

that gentleman has published in the *Ibis* magazine for April, 1866. Several fine series of these bones having been sent to England, some were purchased by the Trustees of the British Museum, and formed the subject of a memoir "On the Osteology of the Dodo," read by Prof. Owen at a meeting of the Zoological Society of London, 9th January, 1866. This memoir is understood to be nearly ready for publication, and will appear, copiously illustrated, in the "Transactions" of that Society. Some other fine series of these bones have, by the liberality of Mr. Clark, passed into the possession of one of the members of your Committee, and a portion of them is now exhibited. Several smaller series of bones have likewise been variously distributed, by sale or gift, both in England and the Continent, so that numerous museums and collections have reaped the benefit of Mr. Clark's valuable discovery; the importance of which may be better appreciated when it is remembered that previously the only remains of the Dodo known to naturalists were the head and foot at Oxford, the skull at Copenhagen, the portion of an upper mandible at Prague, and the foot in the British Museum. Now it is believed that almost every bone of the bird's skeleton has been recovered, with the exception—though that is an important exception—of the extremity of the wing. The attention of Mr. E. Newton has been especially called to this deficiency, which seems likely to be supplied by a thorough and systematic examination of the "Mareaux Songes," or at least of the part of it which has been most prolific in Dodos' bones. That gentleman has accordingly determined to carry out the undertaking so far as may be expedient; but according to the latest accounts received from him, he had been obliged to defer commencing operations in this quarter till the expiration of the rainy season, as the marsh still continued to hold much water, and he expected to be able to do no real good there until next month, when the Committee hope that complete success may attend his excavations.

Section A.—MATHEMATICAL AND PHYSICAL SCIENCE.

Description of a New Proportion Table, equivalent to a Sliding-rule, 13 feet 4 inches long, by J. D. Everett, D.C.L., Assistant Professor of Mathematics in Glasgow University.

The distinguishing feature of the new arrangement consists in breaking up each of the two pieces which constitute a sliding-rule into a number of equal parts, and arranging these consecutively in tabular fashion, in parallel columns, the columns in one of the two pieces being visible through openings cut between the columns of the other. The largeness of the scale is such that the space from 1 to 1*·*1 is divided into a hundred parts, the smallest of these being about $\frac{1}{100}$ of an inch long. The material employed is Bristol board, the dimensions of each piece, exclusive of margin, being 16 inches by 8 inches. Operations can be performed with the same accuracy as by four-figure logarithms, and with greater ease and expedition. Time can be computed within a few seconds from an observed altitude of a celestial body; and by an appropriate formula lunar distances can be corrected as accurately as by the ordinary methods in which six-figure logarithms are employed. Formulae not adapted to logarithmic calculation are directly available, in connexion with small tables of natural sines and tangents.

Extract of a Letter from Senhor Capello, of Lisbon, on Magnetic Disturbances, by Balfour Stewart.

The author sent three tables, representing graphically the most important results deduced from the curves of our magnetograph for the year 1864. He had followed the plan of General Sabine in separating the greatest disturbances of the three elements. Thus he had considered as a disturbance of the declination every ordinate which differed from the monthly mean by 2'3" or upwards, while the separating value for the horizontal force was '0011 of the whole horizontal force, and that for the vertical force '00032 of the whole vertical force. The instruments were at work during the whole of the year 1864; and of the 8,760 hourly observations of each instrument, the observers only failed in measuring 97 for the declination, 139 for the horizontal force, and 159 for the vertical force instrument. The number of disturbances have been, for the declination, 1,043; for the horizontal force, 810; for the vertical force, 982. From a diagram exhibited, giving the hourly variations yearly and half-yearly of the three elements, it was seen that the progress of the declination for each period is very regular. The mean daily range of declination during the six months from April to September, when the

sun is north of the Equator, is 9'20"; while during the six months from October to March, when the sun is south of the Equator, this range is less, being barely 6". For the dip the corresponding curves are much disturbed from 6 p.m. to midnight, especially for the six months when the sun is north of the Equator. The total force gives a well-pronounced minimum at 11 A.M. during the six summer months, and 11.30 A.M. during the six winter months. The daily range is greatest for the six summer months, and least for the six winter months. The diagram of disturbances gives for the declination a maximum of the westerly disturbances at about 8 A.M., and a minimum about 10 in the evening. On the other hand, the maximum of easterly disturbances is about 10 in the evening, and the minimum about 6 in the morning. The curves for the horizontal force disturbances are irregular. The maximum of disturbances tending to increase the horizontal force takes place about noon, while the minimum is about 1 A.M. But here one is much struck with the great disproportion between the disturbances tending to increase, and those tending to diminish, the horizontal force, the latter being both the most numerous, and the greatest in amount. The maximum and minimum of these latter disturbances take place a little later than the maximum and minimum of the disturbances tending to increase the force. With respect to the vertical force, the curve of disturbances tending to increase the element resembles, to some extent, the curve of easterly disturbances, or disturbances tending to diminish the westerly declination. In this same diagram, blue and red curves were made to represent the whole effects of the perturbations, or the quantities which it is necessary to apply to the line of no disturbance, reckoned a straight line, in order to reconstruct the curves with the perturbations. Thus, the effect of disturbances upon the declination is to cause the needle to deviate towards the west during the hours of the day, but towards the east during the hours of the night. The effect of disturbances upon the vertical force is of a reverse kind, tending to diminish the element during the hours of the day, but to increase it during those of the night. With regard to the horizontal force, it appears that the disturbances tend to diminish this element almost during the whole of the twenty-four hours. A third diagram represented the mean hourly movements of the north pole of the freely-suspended needle, in a plane perpendicular to the direction of such a needle, both for the whole year, and also for the winter and summer seasons.

On a Fluid possessing the power of Rotating the Planes of Polarization of Rays of the opposite ends of the Spectrum in opposite directions, by Professor Jellott.

The existence of this fluid was discovered in conducting a series of experiments with a new saccharometer, which the author had formerly described to the Royal Irish Academy, and which he now exhibited to the Section. In making use of this instrument, it became necessary to compare the rotary powers of the two well-known species of oil of turpentine—namely, 1, the American oil of turpentine, which is obtained from the *Pinus australis* of North Carolina; and 2, the French oil of turpentine, obtained from the *Pinus maritima* of Bordeaux. As these fluids, which are opposite in their rotary powers, are chemically identical, and very slightly different in their refractive and dispersive powers, it was natural to expect that no difficulty would be found in determining the relative lengths of two columns of these fluids respectively, which should perfectly compensate each other. Two columns of fluid are said to compensate each other when a ray of polarized light, transmitted successively through these columns, emerges from the second column in the same state in which it entered the first. The actual result, however, was wholly different from this anticipation. When the relative lengths were so determined that the intensity of the light transmitted respectively by the two parts of the analyzer was the same, the colours of these two spectra were wholly different. In reasoning on the difference of colour, the author was enabled to perceive that the American oil of turpentine was much more highly dispersive of the planes of polarization of the elementary rays than the French oil. It is plain, therefore, that if the lengths of the columns be so proportioned that the rotation may be the same for the mean ray, the more dispersive (in the sense just defined) fluid will turn the plane of polarization of the red ray through a less angle, and that of the violet ray through a greater angle than the less dispersive fluid. Hence, remembering that French oil of turpentine is left-handed, and American oil of turpentine right-handed, it is plain that if a red ray be transmitted

* This Report was read by Professor A. Newton in Section D.

through two columns, whose lengths are so proportioned, the total effect will be left-handed rotation; whereas, if a violet or blue ray be so transmitted, the effect will be right-handed rotation. As these fluids, being identical in composition, could scarcely act chemically on each other, the same effects might be expected from a single fluid produced by mixing these two columns. This the author found to be, in fact, the case. The rotating fluid was formed by mixing the two oils in the following proportion: American oil of turpentine, 67; French ditto, 33. When a column of this fluid, whose length was four inches, was traversed successively by a solar ray which had been previously transmitted through plates of red and blue glass, the rotation produced in the plane of polarization of this, which is the extreme red ray, was found to be $-1^{\circ} 35'$. Again, when the same column was traversed by a ray which had been previously transmitted through a solution of ammoniacal sulphate of copper, the rotation was found to be $+2^{\circ}$. This phenomenon is best shown with solar light, but it may be shown, though with less distinctness, with the electric or oxyhydrogen light. The proportion of oils given above must be understood to refer only to the particular specimens of the oils which were used in making these experiments. The rotary power of commercial oil of turpentine, more especially that of the American oil, is very variable.

Remarks on the Variable Star lately discovered in Corona Borealis, by J. R. Hind.

Early in June last the author received a letter from Mr. W. Barker, of the Customs Department, London, Canada West, stating that the remarkable variable star in Corona Borealis, which was seen in Europe on May 13, had been discovered by him on the 4th of that month. He thus describes its variations: "I first observed it on the 4th of May at 9 P.M., when it was somewhat brighter than ϵ Coronæ; it rapidly increased until the 10th, when it was fully as bright as Alpha ϵ (α Coronæ); it was at its maximum. On the 14th it had decreased to the third magnitude, on the 18th to the fifth. On the 19th I could just discern it, and on the 20th I could see it no longer with unaided vision. On the 20th I observed it through my telescope (one of Cooke's 5 feet 4 inch object-glasses). With a power of 133, it showed a beautiful clear disk, and was exceedingly brilliant, and had a ruddy tinge. I still see it as a telescopic star; its light about equal to the companion of Polaris." Mr. Barker made no public announcement of his discovery until the 16th of May, when he communicated a paragraph to the *London Free Press*, and forwarded copies of the paper to various astronomers in this country. "Astronomers will be interested to learn that a new star has made its appearance in the constellation of Corona Borealis. It is of the third magnitude, and is situated about one degree S.E. by E. of ϵ Coronæ, and three degrees from π Ophiuchi, in a direct line between the two. It also forms the apex of an equilateral triangle with β and ζ Herculis. Hour of observation, 9 P.M., 14th May, at London, C.W." In this communication no reference is made to any observation of the star previous to the 14th of May, probably because Mr. Barker merely intended his notice to refer to its appearance at the date of his letter. Several European astronomers, ignorant of Mr. Barker's observations, have conjectured that the star must have burst forth with astonishing suddenness. Mr. Schmidt, of Athens, a practised observer, thought it could not have been so bright as a star of the fifth magnitude on the 12th of May, early in the evening, or he must have perceived it; and M. Courbasse, at La Rochelle, was convinced it was invisible to the naked eye on the 11th; yet at this date it must have shone, according to Mr. Barker's observations, as a star of the second magnitude. This is by no means a solitary instance in proof of the little value which attaches in many cases of a similar kind to merely negative evidence. In his own astronomical practice, the author had met with startling instances, and striking ones may be found in the history of these phenomena of variable stars. Tycho Brahe thought the celebrated new star of 1572, which he detected on returning home from his laboratory, and which was then shining as a star of the first magnitude, could not have been visible an hour or so previously, and yet he is well known to have been preceded by several days in the discovery of that wonderful object. It will be most desirable to possess every particular relating to Mr. Barker's observations between the 4th and 14th of May, which it may be in his power to furnish. Mr. Barker thinks he saw this star one or two years earlier, when the constellation was in the S.E., about 9 P.M., and Sir John Herschel announces his having recorded a star in this very

position in one of his revisions of the heavens. The apparition of this star will be memorable as having afforded an opportunity of applying the spectrum analysis to one of this class of objects. The valuable and highly interesting observations by Mr. W. Huggins and others are the results.

Section B.—CHEMICAL SCIENCE.

On the Olefines in Relation to the Isomerism of Vinic Alcohols, by Mr. E. T. Chapman, F.C.S., and Mr. William Thorpe, F.C.S.

It is a well known fact that ethylene, the lowest known term of this series, and according to recent theories the lowest possible term, may be converted into an alcohol, and that the alcohol so obtained possesses not only the composition, but also the properties of common ethyl alcohol. On the other hand, amylene, a hydrocarbon belonging to the same series, may, by treatment similar to that which caused ethylene to yield common alcohol, be converted into an alcohol possessed of the same composition as ordinary amyl-alcohol, but of the same properties. Under these circumstances, an investigation of the olefines, independently of its intrinsic interest, might throw light on the great problem of isomerism. From the paper it was clearly shown that they had not succeeded in obtaining three isomeric alcohols, but they have succeeded in obtaining alcohols belonging to each of the three series. Firstly, they had amyl and hexyl alcohols; secondly, they had an alcohol isomeric with hexyl alcohol obtained from hexylene. This alcohol differed in its oxidation products from the alcohols on the one hand and from the olefines on the other; lastly, they had an amyl alcohol, which could be designated an alcohol obtained from amylene by a process different from that which yielded us B. Hexyl alcohol in its oxidation products corresponds with the olefine in this particular, thus differing essentially from the B. alcohols.

On the Chemical Action of Medicines, by Dr. Benice Jones.

Assuming the truth of the law of the conservation of energy, it follows that no creation or annihilation of fever by food, medicine, or exercise can take place, and from this it also follows that the two great actions of remedies are first, to increase the liberation of force in the body; and second to increase the resistance to that liberation of force within. Omitting other actions now for the sake of clearness, it may be said that the great functions of medicine are to affect quantitatively or qualitatively the oxidation and nutrition which continually takes place in each of the different textures of the body. Oxidation and nutrition are affected by medicines in at least two ways. First, directly, by the passage of the medicines into the different textures of which the body is composed. Secondly, indirectly, by the action of the medicines on the nerves that regulate the circulation, whereby the flow of blood through the vessels is increased or diminished. Although oxidation and nutrition in the body are dependent one upon the other, and though they cannot be separated in action, yet, for clearness, medicines may be divided into: First, those that promote or retard oxidation. A, directly promoting oxidation within each particle of any or every texture. B, indirectly promoting oxidation, through the medium of the nerves acting upon the heart and blood-vessels. C, directly retarding oxidation. D, indirectly retarding oxidation, by acting on the constitution. Second, those that promote or retard nutrition. E, directly promoting nutrition within each particle of any or every texture. F, indirectly promoting nutrition through the medium of the nerves acting on the heart and blood-vessels. G, directly retarding nutrition. H, indirectly retarding nutrition, by acting on the circulation. In the first division of class A may be placed iron, oxygen, ozone, alkalies, chlorine, iodine, bromine, permanganates, iodates, chlorates? nitrates? &c. Metallic corrosive poisons in large doses. Mercury, copper, &c. Vegetable irritants, from Croton oil downwards. Animal irritants, as cantharides, &c.; and motion, heat, light, electricity. In class B may be placed all remedies that increase the circulation by acting on the nerves and muscles of the heart and vessels. In class C all the remedies which formerly constituted the medicinal part of the antiphlogistic treatment. Vegetable and mineral acids and substances that become acids, sugar, starch &c., preparations of lead, and rest. In class D, morphia, &c., &c. Bleeding. In the Second division in class E may be placed iron, phosphate and carbonate of lime. Cod-liver oil and other oils and fats. Phosphorus? In class F the same substances as in class B.

In class G, lead, &c., and in small doses zinc, silver, copper, arsenic. In class H the same as class D. Not only in medicine but in surgery the same two principal indications for treatment are always present. The surgeon regulates quantitatively or qualitatively, chiefly by mechanical means, the oxidation and the repair of the body. Thus in croup he promotes oxidation by mechanically opening the trachea. He retards oxidation after mechanical and chemical injuries, by bleeding, cold, rest, and defending the body from fresh irritations. He directly promotes nutrition by removing pressure, as in the operation for strangulating and hernia; he retards nutrition by pressure or ligature, as in the treatment of aneurism. As in medicine, so in surgery, the actions of oxidation and nutrition are mutually dependent everywhere, and no separation of these two functions in any part of the body exists, although for clearness in this sketch the two most important of the many chemical actions of medicines were dealt with separately. The progress of all accurate knowledge of the actions of medicines depends now on exact chemical and physical experiments, and by these alone will the practice of medicine lose its doubts, its difficulties, and disagreements. Instead of being, as formerly, blind wielders of heavy clubs, that cured the disease or killed the patient; or instead of being, as at present, "judicious," or injudicious "bottle-holders," in the fight between disease and health, physicians will at some future time estimate more or less exactly the effect of the increased or diminished action of any one force upon all the other forces concerned in the production of general or local disease; and by adding to the resistance to the action of any one or more forces, or by liberating more energy by means of the powers that are latent in food and medicine, they will restore that equilibrium of action in the body upon which our health depends.

Section C.—GEOLOGY.

On the Sinking of Annesley Colliery, by Edward Hedley.

A map and section of the topographical and geological positions of Annesley Colliery were exhibited. It is situated close to the railway from Nottingham to Mansfield, and about eleven miles from the former and six miles from the latter town. Its geological position is on the new red sandstone, and nearly two miles east from any other coal workings. The seam of coal intended to be won is that locally known as the Top Hard Coal, and which is now being worked at the Portland, High Park, Hucknall, and Cinder Hill Collieries, all in the immediate neighbourhood. The estimated depth of this coal at Annesley Colliery is about 400 yards. The sinking of the shafts commenced in January, 1865, and when finished it is intended that each shaft shall be 13 ft. diameter. The first measure sunk through was a deposit of loose dry sand and gravel, 6 ft. in thickness. This and a bed of sandstone below it, 62 ft. in thickness, comprise the new red sandstone sunk through. This lower bed consists of a soft friable sandstone of a light red and white colour. In one shaft it was divided by beds of strong red marl, but in the other these were absent, and the bed formed an unbroken rock. As the area of surface drained by this rock is not extensive, the quantity of water met with in sinking through it was inconsiderable. The next strata is the red marl, forming the upper part of the Permian measures. This marl is 27 ft. in thickness, it is of a dark red colour, with lumps of white intermixed. It is worked extensively in the neighbourhood for the manufacture of common building bricks, and when properly ground and tempered it makes good bricks. The first bed of the magnesian limestone formation is a freestone, 18 ft. thick. It is very hard at the top for about a foot deep; in this are numerous small veins, containing small quantities of spar, lead ore, and iron pyrites; below this the stone is much softer, and is light red and white mottled in colour. Below the freestone stratum, there are several thin beds of pure limestone, divided from each other by beds of shale or bind. In one of these thin seams of limestone, which is one and a-half ft. thick, and at a depth from the surface of 121 feet, there was found a quantity of lignite in the original form of branch trees. These were destroyed in blasting up the limestone, which completely enveloped them, and the lignite preserved has since gradually crumbled to small pieces. Lignite in limestone has never been found before. Nothing more of a fossiliferous character was found in passing the Permian measures, although a careful examination from time to

time was made for that purpose. The limestone shales underlying the limestone and forming the lower part of the Permian measures were upwards of 80 feet in thickness. They mostly consist of strong, compact shales of a light grey colour; the bottom part is soft, and of quite a marly character. The coal measures are found in their regular order, dipping nearly due east, and, so far as has been proved, conformable with the Permian measures. The usual alternating strata of sandstone, shales, thin coals, and fireclays comprise the measures hitherto passed through; they are compact and impermeous to water. The longest shaft is now 200 yards deep, and has passed through several thin seams of coal, none of which, however, are workable. In conclusion, the author calls attention to the importance of this sinking, with regard to future coal mining operations in the county of Nottingham, as it is, with others, a conclusive proof of the practicability of sinking through the water-bearing strata of the new red sandstone and Permian formation, which cover a large area of coal measures in the east part of this county.

On an Attempt to approximate the Date of the Flint Flakes of Devon and Cornwall, by C. Spence Bate.

The author set out by observing that geologically flint did not exist throughout the counties of Cornwall and Devon, but flint flakes and chips were broadly scattered in some localities, such as the neighbourhoods of Barnstaple and the Lizard. The character and appearance of the flaked specimens were various. The assertion of archaeologists, that they were the result of human labour, either, as in the more perfectly adapted forms, of design, or were the waste material left in the efforts to produce those forms, had caused much interest and importance to be attached to their discovery. It appeared to Mr. Bate that by a careful study of the geological history of the different formations with which the flints were in connexion, an approximation of the period at which they were deposited might be arrived at. Having given a description of the beaches, he remarked that as the flints were in the soil that surmounted the ancient sand bed, which had been deposited since the present beaches had been at their present level, it followed that they were more recent than the most recent elevation of land upon the coast. The question then arose, whether or not, since the flints had been found in the submerged forest at the northern burrows, they might not have been deposited prior to the latest depression of land upon the coast. That the great pebble ridge was moving inwards was certain, though the rate of progress had not, he believed, been determined. But the gradual movement of the ridge inwards, however fast or slow, exposed all the shore that was seaward to the destructive agency of the waves; and it was to that, and not to any variation in the level of the coast, that he thought the submergence of the forest was due. It was important to inquire into the connexion of the flint flakes found at Northam and Croyde with those scattered over the western promontory. The flints were discovered with other stones and evidences of the most primitive kind of human industry. Some of the stones showed evidence of having been used as hammers, and others as whetstones; and with them had been found portions of pottery, of very coarse structure. Certain of the flint flakes had evidently been under the action of fire, and along with them were small traces of charcoal and pieces of bone. Those severally having been collected together, afforded presumptive evidence that the spot on which they were found was in the neighbourhood where a colony of ancient people existed. If the flakes were looked upon as parts of more perfect tools, which he thought they were, some being the heads of arrows, of no use without a bow, he considered that argued a higher degree of thought than either the hatchet or spear. As arrows were in use and retained as instruments of the chase and war until a late period, it was tolerably certain that flint continued to be adopted, owing to the scarcity of metal, long after the use of iron was known. While pursuing research in an ancient British burying-place, in which the Roman feature of civilization had largely entered, a grave containing a human skeleton was found, besides two vases, a bronze-headed fibula, some rings and parts of an amulet, and a specimen of a flint core, from which flakes had been struck. The presence of the flint core was witness that the material was in use after the Roman invasion, and therefore he contended that there was no evidence to show that the flint flakes might not be coeval with the civilization of the period

which immediately preceded the introduction of Roman civilization into this country.

On the Correlation of the Lower Lias at Barrow-on-Soar, Leicestershire, with the same Strata in Warwick, Worcester, and Gloucester shires: and on the Occurrence of the Remains of Insects at Barrow, by the Rev. P. B. Brodie.

The first part of this paper dwelt on the correlation of the Lower Lias at Barrow-on-Soar, Leicestershire, with the same strata in Warwick, Worcester, and Gloucester shires. The latter portion of the paper had reference to the occurrence of the remains of insects at Barrow. The author remarked that not long since his friend, Mr. Wyatt Edgett, obtained a portion of a gigantic wing of one of the *Libethelidæ*; and no doubt other genera would be discovered there, as also in Nottinghamshire, in the same manner as they had been by his friend, Mr. Norwood, in the insect limestones of Yorkshire.

On Fossils from the Graptolite Shales of Dumfriesshire, by H. A. Nicholson.

The author described some bodies found along with the graptolites, which resembled them in texture, although differing in form. They were bell-shaped, averaging 3-10ths of an inch in length, and 2-10ths in breadth, and were provided at one extremity with a prominent spire or mucro, the other terminating in a nearly straight or gently curved margin. The occurrence of these bodies in shales crowded with graptolites and graptolitic germs, would seem to warrant the conclusion that they were "gonophores," or "ovarian vesicle," at first attached to the parent stem, but finally becoming free and swimming zooids. Bodies somewhat similar had been described by Prof. Hall, as occurring in connexion with the stipe of *Graptolites Whitfieldi*, and were regarded by him as true productive cells. If that conjecture as to the nature of those curious bodies were correct, then the *Graptolitidæ* would have to be finally referred to the Hydrozoa, and would find their nearest living analogues in the Sertularidæ, from which, however, they would always be separated by characters sufficiently distinct.

Section D.—DEPARTMENT OF PHYSIOLOGY.

On the Colour of Man, by John Davy, M.D., F.R.S.

The author premised that in bringing forward this subject he was influenced more by the desire of inciting inquiry and discussion, than by the hope of adducing any new facts of importance for its elucidation. After enumerating the varieties of colour of the human races and their connexion with latitude and climate, he considered the probable causes to which the difference of colour may be referred. Of these he placed first, exposure to the sun's rays; it being an established fact, expressed in ordinary term by "sun-burn," that the sun's rays acting on the skin have a darkening effect; next, warmth of climate and an average high temperature throughout the year, under the influence of which there appears to be a tendency to accumulation of carbon in the system, as indicated by the little difference of colour of the arterial and venous blood under exposure to a high temperature. An explanation of certain exceptional instances was next offered; as of the darker hue of the Esquimaux, to exposure to the sun's rays during that portion of the year that the sun in the Arctic regions is constantly above the horizon; and during the other portion, their winter, to their living shut up in a close impure air, and to their food being chiefly of a kind abounding in carbon and hydrogen; or taking an opposite instance, as that of mountaineers, who though much exposed to the sun are commonly fairer than the latitude they inhabit would seem to warrant, to their blood being better aerated from the purer air inhaled and the active exercise they take, producing an accelerated action of the heart, and a more rapid flow and circulation of the blood. Further, he adverted to hereditaryness on Atavism, as deserving of attention in considering the colour of races, and more especially its importance as to the great question of unity or difference of races *ab origine*; for if climate should be found to have greater effect than blood in modifying colour, unity might be inferred, and *vice versa*. In conclusion, he dwelt on the connexion of good colour and a fine complexion with health, to which nothing can contribute more than pure air, and exercise in the open air.

Section D.—DEPARTMENT OF ANTHROPOLOGY.

On Phenomena of the Higher Civilization traceable to a Rudimental Origin among Savage Tribes, by E. B. Tylor.

After remarking that it was important to us to study the habits of the lower races, he said the stories of uncivilized races about their gods

and heroes, cosmogonies, transformations, and origins, show us the mythologic stage underlies the poetry and religion of the Greeks and other nations, from among whom the highest modern civilization has grown. The New Zealand myths held that we have had two primeval ancestors, a father and a mother, *rangi* and *papa*, heaven and earth. The earth, out of which all things are produced is our mother; the protecting and overruling heaven is our father. In conclusion, he referred to primitive marriages as connected with the development of races from savage to civilized life, through the different stages of exogamy, or the law of marriage out of one's tribe. He believed one of the services of savage tribes was to enable civilized men to understand their position in the world.

On the Principle of Natural Selection applied to Anthropology, in Reply to Views propounded by some of Dr. Darwin's Disciples, by Dr. James Hunt.

The author's main object was to show that the recent applications of the principle of "natural selection" to Anthropology by some of Mr. Darwin's disciples was wholly unwarranted, either by logic or fact. He remarked that some Darwinists in this country were even now teaching, as a scientific induction, that there is at the present day but one species of man inhabiting the globe. After alluding to the opinions of Professor Huxley and Mr. Wallace, and especially to an opinion of the former, that polygenists had failed to show a specific difference between any two species of man, and that the test of hybridity had failed; and to another statement of Professor Huxley's, to the effect that no one could be now found to assert that any two stocks of mankind differ as much as a chimpanzee and an orang do, he observed that Anthropologists were bound to take the totality of characteristics of the different types of man into consideration. Man is chiefly distinguished from the ape by his mental character, and to which they must look for assistance in our system of classification.

Dr. GREARSON wished to refer to the Book of Genesis.

The PRESIDENT (Mr. Wallace) said they did not allow Scripture to be referred to. They did not consider Scripture to be any authority on the subject of science.

Dr. GREARSON asked them not to follow the Anthropologists; reminding them that the sun had not yet risen which was to show them the light.

The Rev. D. HEATH asked whether there was any evidence to show that the 150 races of dogs had been derived from one animal. He could not discover that the Newfoundland dog was known till that island was discovered, whereas the greyhound was on the Egyptian monuments. Out of nine races of men, from which particular race did eight of them proceed?

Section E.—GEOGRAPHY AND ETHNOLOGY.

On Arabia, by W. G. Palgrave.

Mr. PALGRAVE said it was nearly a year and a-half since he had the honour of giving an account of his going through Arabia, and that account had since been published; but he should to-day call their attention to certain points respecting that country which in Europe were not known, or were imperfectly understood. In the East equal ignorance of Europe prevailed. In Damascus he had heard an opinion expressed that Europe was but one great kingdom governed by seven kings all living in one city. On one occasion, in company with an Eastern gentleman, that person told him his notions of the conclusion of the war between the Western Powers and Russia. He said that the Emperor of the French had a son born to him, and that in consequence the village of France was illuminated. The Emperor of Russia, looking out of his window, saw the light, and making inquiry of his grand vizier was told the occasion. Thereupon he ordered the village of Russia to be illuminated and guns to be fired; and being sent for to stand godfather to the baby, the two Emperors met in the parish church, where peace was made between them. That was a specimen of the knowledge which existed in the East regarding Europe. In every village where the Arabian language is spoken the population was divided into two portions, one with white, the other with red flags, representing respectively the north and south. The feud had continued *ab antiquo* to the present day. Even the village children carry on the conflict; but no Arabs, or very few of them, know the origin of this factious division. Mr. Palgrave, however, discovered the origin of it, which, he said, depended partly on geography, and partly on ethnology. The centre of Arabia was a table-land, forming

he watershed to the south and to the north, each of which it divides from the other. In the north were the Mahabis, of which the Bedouins were the gipsies—the orthodox and non-smoking population of Arabia. The southern population were of another race, and even of a somewhat different language. Between the two a constant conflict for supremacy was kept up. He had seen an army with the white banner of Medj marching to war from the north, and as it happened to victory. Subsequently in the south he had seen everywhere the red banner, which had been preserved for 2,000 years unaltered. There was a great difference of appearance between the Arabs of the north, who were purely Semitic, a remarkably fine, intelligent race, and who pretended to trace their ancestors to the same stock as the Israelites. In the south the aspect of the people was different; the head not long, but round, skin darker, and altogether much more like an African than an Asiatic race. In institutions, also, they differed from the Northern Arabs, and in religious belief; the northerners being, with few exceptions, very strict and even fanatical Mohammedans, observing all the dietetic requirements of the Koran. They, thinking tobacco to be intoxicating, did not use it. In a shipwreck from which Mr. Palgrave escaped, one of the survivors, who was imbued with the northern religious ideas, attributed the wreck to the enormous wickedness of Mr. Palgrave in smoking. The southerners approached more to the Africans in religious belief, having no established forms or prejudices; in fact, they were free thinkers. Another point was this, of which they had ample evidence: in the North the language was strictly Arabic, while in the South great difference of dialect existed—differences in declension and in the formation of verbs. Afterwards, in Germany, he had an opportunity of consulting eminent philological authorities, and by them he was informed that the differences in the South Arabic indicated an origin from East Africa, in fact, from the descendants of Ishmael. These were the differences he had found between the two portions of the Arabian continent. Now, with the northern portion of that continent, it was not likely we should ever have much intercourse, and even Central Arabia although a pleasing enough place to the natives, was a comparatively barren country, totally without rivers, notwithstanding that in old maps rivers were laid down as flowing across the continent where he had found a barrier of mountains some thousands of feet in height. Central and Northern Arabia was almost exclusively a pastoral country, and was also famous for its uncultivated breed of fine horses. But it was different as respects the eastern and a portion of the southern parts of Arabia. In Oman they had a district as fertile as that of the opposite shores of India; and besides there was the route down the Euphrates and by the Persian Gulf to and from India, which was much preferable to that by Egypt. Along that route lies the kingdom of Oman and its people. Now, what was that people? for this was a point which would speedily become a practical one for Englishmen. Although the northern Arabs were intelligent and hospitable, yet they were like their country, unimprovable—a country without water, and impossible ever to be reduced to any use to man from its barrenness. The race in those districts had long since reached their highest point of civilization, which was totally incompatible with that of the present day. In the South and East it was quite different. A fruitful soil, well watered, and a cool climate, with a race who, although not so advanced as that of the North, were yet susceptible of all improvement—a progressive race, which had even founded a maritime state. It was with this people England would speedily have increasing intercourse, and in whom they would find a tractable race, and a full fruition of commercial relations. Mr. Palgrave concluded an interesting discourse by giving an account of the Mahabis, Mohammedan reformers of Arabia, which was printed at length in his book last year. It comprised a narrative of his own personal experience among those people, whom he described as fanatical but hospitable, and extremely honest, and who, he said, wanted to keep him in the country by giving him a wife. Marriage there, it seems, ties a man not only to his wife, but to the country. Castigation also seems largely used to punish and reclaim Mohammedans guilty of backsliding. Even the little children were not allowed to play in the streets, unless their amusement should take the form of reciting the set forms of religious prayer. Mr. Palgrave stated that he was

shortly again about to leave this country for the East.

On the Probable Lower Course of the Limpopo, by Mr. Thomas Baines.

In that comparatively unknown region, travellers had heard a report of the existence of remains of great buildings of a high order of architecture. Small-pox, however, broke out and prevented a visit to those ruins.

Sir RODERICK MURCHISON, in reference to the rumour respecting these buildings, observed that some had supposed them to be the ruins of Solomon's Ophir; but he did not think that hypothesis tenable.

On the Zambesi and its Westernmost Sources, by Mr. Thomas Baines.

The author described certain explorations made for the purpose of identifying rivers or branches of a river bearing different names, with the Zambesi; but nothing quite reliable could be learnt on the subject. The natives, when the river does not rise at the proper time, sacrifice a baby by drowning it, the idea being that the infant finds its way to the river deity, and asks him to cause the flood. The paper suggested various travelling preparations suited to the nature of the country, which ought to be adopted in future explorations.

On the Eruption at Santorin, and its Present Condition, by Commander Lindsay Brine, R.N.

The author described the violent upheaving of an enormous cone, which day by day increased its base. Within this cone an intense glowing heat was developed, and fissures opened in its sides, giving vent to clouds of suffocating steam vapours, accompanied by various sounds, changing from a low roaring to a violent shrill whistling, as of steam blowing off.

Section F.—ECONOMIC SCIENCE AND STATISTICS.

The President, Mr. James E. Thorold Rogers, alluded to the contingency, at no remote date, of a considerable exhaustion of certain mineral resources in this country, and the altered position which England might consequently assume, and to the present condition of the money-market. The first of these questions raises a variety of issues, the magnitude of which cannot be over-estimated; the second is a crisis unparalleled for its severity and its duration. It cannot be denied that a limited quantity of any natural product, the demand for which is incessant, must ultimately be exhausted. But the real question, it seems, is, when will the scarcity price operate on consumption, and when it does so operate in what will the saving be effected? That the scarcity price is not yet operative is manifest from the increase in the aggregate consumption of coal, and from the increased production of metals; for it is in the smelting of metals that the largest consumption occurs. Nor can it be doubted that when the saving becomes necessary from enhanced price the economy will be exercised in this direction. But the total value of all metals produced in this country in the year 1864 (the largest in value, though not the largest in amount, yet recorded) was worth little more than 16 millions, a great but not a dominant quantity in the annual aggregate of British industry. It would seem, then, that the alarm, if not premature, is certain excessive; that there will be abundant warnings of future scarcity, and necessary economies in dealing with the residue long before that residue verges to exhaustion. The material wealth of this country, greatly as it is related to its manufacture, one of the raw materials of which is locally limited, is far more fully derived from its geographical position, and thereupon its trade, the advantages and aids of which are permanent. Occupying, as Great Britain does, the most central position between the New and the Old World, it is, and will be so long as its people are industrious and resolute, the highway and the mart of nations. Its commerce, by virtue of causes which cannot be reft from it, increases at a far more rapid rate than its manufactures; and if that commerce remains unfettered and unshackled there seems no limit to the width which its markets may attain. He would not enter on the vexed question of the currency, or criticize the Act of 1844. With some thinkers this system is lauded as one of consummate wisdom; with others it is censured as one of needless and mischievous interference with that part of the machinery of trade which would be self-adjusting without it, and which is not really supported by it. As a rule, when one set of persons, confessedly competent to form a judgment, decide that a law dealing with commerce is wise and useful, and another set of persons equally competent declare that it is foolish and mis-

chievous, it will generally be found, in course of time, that the latter are in the right. Such was the case with the Colonial system, with the Corn Laws, with the Navigation Laws, with the Sinking Fund, with the laws regulating or prohibiting the exportation of coin, with bounties, with export duties, with the favoured nation clause in commercial treaties. It has been stated that the cause of the present crisis has been excessive or over-trading. As far, however, as can yet be discovered, it seems to be due far more to imprudent action on the part of certain banks, which have made advances at long dates, or on securities not readily convertible. The distrust which has followed on the failure of some among these banks led to the absorption of a large amount of the note currency by the solvent banks, with a view to making their position impregnable. This retention of notes, as it limited the amount of accommodation, indirectly raised the rate of discount, and thus it followed that as long as the rate is high the notes are hoarded, and as long as the notes are hoarded the rate will be high. Perhaps the contingency of such a deadlock as that of this year may, concurrently with the restrictions of the Act of 1844, or independently of them, be rendered more frequently imminent by the increased inducements in the shape of high rates of interest offered to the public on deposit accounts. In 1857, the rate of discount touched nine per cent., just before the relaxation of the Act. It has stood on the present occasion for some weeks at ten; and unless British commerce is now conducted under far more favourable circumstances than it was nine years ago, the effect must ultimately be ruinous to the trader—must speedily be followed by a great rise in general prices, and, in all probability, by a glut of capital at no distant date. The value of agricultural statistics does not lie simply in the aid which they may afford in indicating the probable course of the market, and in saving it from needless fluctuations, but in suggesting what is the probable annual deficiency in supply. Many years have passed since this country grew enough food for its inhabitants. That its prosperity may be uninterrupted, it will be necessary that it should rely increasingly on foreign produce. That its people should be well fed it is necessary that every facility should be given for the growth and importation of live stock and meat. The table of statistics giving information of the amount of cattle, sheep, and pigs on the 5th of March, 1866, on the presumption that the returns are accurate, is singularly instructive. In round numbers the population of Great Britain is about 24,000,000. In one particular only, that of sheep, is Great Britain on a general level with other countries. There is nearly a sheep to every head of population. But of horned cattle there is only one to about every five; of pigs only one to every nine. Were the amount of horned cattle in France proportionate only to that of Great Britain, France would have a little more than 6,000,000; in fact it has rather more than 14,000,000. The same may be said of Austria. In many of the German States the proportion is higher still. In Denmark the cattle are not very much less numerous than the population. In the United States there is rather more than one head to every two of population. With pigs Great Britain is very scantily provided. In France and Prussia pigs are one to seven; in Austria one to four and a-half. Taking the whole of Europe, the proportion is one to six. In the United States there are more pigs than population. Had the returns supplied us with information as to poultry, the deficiency would have been still more striking. In the year 1865 this country imported more than 400,000,000 of eggs, if the hundred of eggs be taken, as it has been from the earliest time, at 120. The statistics of the cattle returns supply the key towards interpreting the high price of meat, and we may be sure that the price of meat would be higher than it actually is, were it not for those improvements in stock-keeping by which cattle become more available for consumption at earlier dates—improvements which are yearly developed. This deficiency is not greatly supplemented by importation. Small as the stock of cattle is, the annual importations do not amount to more than one one-twentieth of the ordinary stock, while that of sheep is, as a rule, but one-fiftieth. During the present year even these quantities must have undergone a serious diminution. Nor is the import of meat large. The most important item is that of bacon. But even here the largest estimate will not give more than the equivalent of 300,000 pigs. The beef seems to be about equal to the supply of 50,000

oxen. It is matter of regret that no facts have been collected by which we might compare the present and past supply of live stock in Great Britain. He was convinced there has been a general and considerable diminution in the amount of live stock in Great Britain for some years past. It is now comparatively seldom that agricultural labourers are able to keep pigs; it is still more rare that they breed poultry. The enormous importation of eggs suggests that the fowls kept in Great Britain are comparatively scanty. But it is probable that the maintenance of insect-eating birds is an important provision in agricultural economy, and that when we find fault with the destruction of small birds, we forget that our practice is dispensing with a still more important means for checking the ravages of insects, as well as for supplying that great deficiency in live stock which seems to characterize our domestic economy. Possibly the abandonment of much pasture in the northern part of the island to deer forests and grouse moors has considerably lessened stocks of lean cattle and mountain sheep. As to the second important contribution to the statistical information of the present year, he would have desired to see, along with the figures declaring the value of lands and tenements, as estimated for Income-tax, other similar charges, such as the proportion of assessed taxes, and the amount of the poor-rate. It would have been well also had the distribution of the 25 per cent. of "working classes" among the several constituencies been distinctly indicated. Thus, for instance, the persons designated by this name amount to nearly half the constituency of Birkenhead; to not much less in Nottingham; whereas at Birmingham they are taken at less than a fifth, at Bradford considerably under a tenth. Is it possible that the expression "working classes" has been variously interpreted by those who transmitted their reports to the Poor-law Board? It might be expected that there would be a close conformity between values at very remote periods of social history. The proportions subsisting between the prices of labour and food are, or should be, so close and unvarying, that we may always suspect, in fully settled countries at least, that any marked discrepancy between values at different periods is suggestive of removable evils. During the thirteenth and fourteenth centuries the prices of barley and oats, wheat being taken at 100, are represented by the numbers 73.14 and 42.05, and within the last ten years the numbers have been 70 and 45.95. Close as this relation is, the slight discrepancy might, he thought, be accounted for by the incidence of the malt-tax in the first case, and the great increase in the number of horses kept in the second. The effects of unfavourable seasons and interrupted importations—it is only twenty years since the country accepted the principles of free-trade, several years less than twenty years since it has experienced the advantage of that policy—should be recognized in interpreting the money value of the first necessities of life; while the effects of speculative purchases and forced sales are equally dominant in the price current of its conveniences. To interpret a rise and fall in the value of money by the money measure of that which is open to a vast variety of influences, must be an operation in which infinite caution is necessary, or the inferences drawn are untrustworthy or delusive.

On National Banks and the Payment of the National Debt, by Frederick J. Wilson.

It was proposed in the first place that Government shall establish a national bank, in which all persons who do not want their money speculated with should be enabled to deposit it at call and without interest. Those who want interest for their money to deposit it in banks as they at present exist. In the second place, that Government shall be empowered to issue 33½ millions a year for paying off the National Debt of 800 millions in twenty-four years, and keeping up the payment of interest in full. They would at the end of twenty-four years have 300 millions, and in twenty-one more years 804 millions would be available to pay off the outstanding paper of 800 millions—or in other words, that the country can, in forty-five years at latest, be free of debt and interest.

On some of the Results of the Free Licensing System in Liverpool during the last Four Years, by the Rev. W. Caine.

Mr. Caine (of Manchester) drew a sad picture of Liverpool, and traced its condition to the drinking promoted by the free licensing system acted upon by the magistrates during the last four years. Within the last four years drunkenness and its

fruits had increased in a far greater ratio than previously. In Liverpool they far exceed the proportion in other towns, manufacturing and maritime. The crime of Liverpool is increasing every year out of all proportion to the rate of the increase of the population. Baron Martin only a few days ago attributed nine-tenths of this crime to drunkenness; and a Lancashire magistrate had declared publicly that "Liverpool was the most drunken, and had the highest range of criminality, of any town, perhaps, in England." Medical papers spoke of it as a "national danger." The Registrar-General spoke of "portentous larkness" on the Mersey. The disproportionate social evils of Liverpool, Mr. Caine thought, were reducible by the diminution of the facilities for the sale of intoxicating drinks.

Section G.—MECHANICAL SCIENCE.

On the Penetration of Shot and Resistance of Iron-clad Defence, by Captain W. H. Noble, R.A.

Captain Noble has lately carried out a series of experiments under the direction of the O.S. Committee for the purpose of determining various points connected with the resistance of iron plates, and his paper forms part of a report which he has submitted to the committee.

The above series of experiments were instituted for the purpose of determining the following points—1st. To determine the relative penetrating effects of two steel shot on an iron plate, provided they strike with the same "work" or mechanical effect, notwithstanding the one may be heavy, with a low velocity, and the other light, with a high velocity. 2nd. To determine the relative resistances of a plate to penetration by two steel shot of similar form of head, and striking with "work" proportional to their respective diameters. In order to determine the first point, the committee fired a number of hemispherical-headed steel shot from a muzzle-loading gun of 6.3-inch calibre at 4½ and 5½-inch unbacked plates, the weights of the shot being different—viz., 85lbs., 70lbs., 106lbs., and the diameters the same—viz., 6.22 inches. The charges with which these projectiles were fired were arranged so that the "work" was the same in each case—that is to say, the velocity on impact of the light shot was much greater than that of the heavy shot, while the expression Wv^2 , weight of shot, multiplied by the square of its velocity, was constant. The results of these experiments were very interesting, and are fully detailed in the tables which accompany Captain Noble's report. The conclusions which have been drawn from these results will be given when the second point has been considered. To determine this question—viz., the relative resistance of a plate to penetration by two shot of similar form of head, and striking with "work" proportional to their respective diameters, the committee fired a series of steel hemispherical-headed shot of various weights and diameters at 4½ and 5½-inch unbacked wrought iron plates, the velocities being so arranged that each projectile should strike with a work proportional to its diameter. Thus, suppose the comparison to be made between a 7-inch shot animated with a "work" represented by 1,000, and a 9-inch projectile, the latter should strike with a "work" represented by 1,286, or in the proportion of 9 to 7. Having finished the details of these experiments, Captain Noble proceeded to consider the effects of shot striking a plate obliquely or at an angle. A small number of experiments have lately been made in connexion with this part of the subject, and, although further trials are necessary, the general results go to prove that the power of perforation possessed by the shot is diminished in the proportion of the sine of the angle of incidence to unity. The subject of cast-iron projectiles next claimed attention, and Captain Noble explained the difference between the effects of cast-iron and steel shot. With the former much of the total "work" is expended in breaking up the projectile on striking, and hurling the pieces in different directions, whereas, when the shot are carefully manufactured of the very best steel, very little "work" is done on the projectile, and in some instances the material of the shot has been so perfect, that its alteration of form after penetrating the plate has been almost inappreciable. From this subject Captain Noble passed to the consideration of the proper form and material of projectiles to be used for the penetration of iron-clad defences. It has been clearly demonstrated by numerous experiments, that ordinary cast-iron is almost useless as a material for the manufacture of the above projectiles. Steel is an excellent material for shot, but it is also most expensive, and as recent experiments have shown that Palliser's chilled iron is almost, if not quite, as good as steel, we shall probably use this material for solid shot, and employ steel for shells alone.

Various forms of head have been proposed for steel projectiles. Thus we have had the flat head, relied on by Mr. Whitworth, the round head, elliptical head, &c. The flat head has gained a great reputation from being the shape used by Mr. Whitworth in his first experiments against the Warrior target. Of all these forms, however, Captain Noble prefers the pointed, or ogival head, and he described, by means of a diagram, the difference in effect between the pointed and the blunt form. The blunt, that is, flat-headed or round-headed shot, on striking an iron-clad structure, such, for instance, as the Warrior, punches a piece of armour out of the plate and drives it into the backing; the shot, however, has no means of ridding itself of this piece of plate, and consequently has to push it in front of it through the backing. It is needless to remark that this piece of jagged armour-plate must greatly increase the resistance which the shot meets in passing through the backing. When, however, the shot is of the form of a pointed ogival, the results of its action are far different; this projectile cuts, or rather tears, through the armour-plate and the pieces of broken plate are bent back and forced into the backing round the edge of the hole; the shot then passes through without carrying any jagged armour in front of it. Captain Noble then proceeded to give a short detail of some late experiments with pointed shot and Alderson's solid-headed steel shell, which goes to prove that this form is much superior to any hitherto tried. The subject of iron-clad ships was then entered on, and a brief summary given of the experiments against targets representing actual vessels. The conclusions which might be drawn from the whole of the experiments were—1st. Where it is required to perforate the plate the projectile should be of a hard material, such as steel or chilled iron. 2nd. The form of head best suited for the perforation of iron plates, whether direct or oblique, is the pointed ogival. 3rd. The best form of steel shell is that in which the powder can act in a forward direction, and which is furnished with a solid steel head in the form of a pointed ogival. 4th. When chilled iron can be made of the best quality it is almost, if not quite, as effective as steel for solid shot, and where the projectile can perforate with ease the chilled hot is more formidable than steel, as it enters the ship broken up, and would act as grape. 5th. To attack well-built iron-clads effectually the guns should be, if possible, not under twelve tons weight and nine inches calibre, firing an elongated projectile of 250lbs., with about 40lbs. of powder. 6th. When the projectiles are of a hard material, such as steel, the perforation is directly proportional to the "work" in the shot and inversely proportional to the diameter of the projectile, and it is immaterial whether this "work" be made up of velocity or weight within the usual limits which occur in practice. 7th. The resistance of wrought-iron plates to perforation by steel projectiles varies as the square of their thickness. 8th. While a plate at an angle diminished the effect as regards power of perforation in the proportion of the sine of the angle of incidence. 9th. The resistance of wrought-iron plates to perforation by steel shot is not much if at all increased by backing simply of wood; it is, however, much increased by a rigid backing either of iron combined with wood, or of granite, iron, bricks, &c. 10th. Iron-built ships, in which the backing is composed of compact oak or teak, offer much more resistance than similarly-clad wooden ships. 11th. The best form of backing seems to be that in which wood is combined with horizontal plates of iron, as in the Chalmers, Bellerophon, and Hercules targets. 12th. An inner iron skin is of the greatest possible advantage. It not only has the effect of rendering the back more compact, but it prevents the passage of many splinters which would otherwise find their way into the ship; therefore, no iron-clad, whether iron-built or wooden-converted, should be without an inner skin. 13th. The bolts known as "Palliser's bolts" are the best for securing armour-plates. In these bolts the diameter of the shank is reduced to that which it is at the screwed end. The author of the paper preferred the English punching system of high charges with small shot to the American racking system of heavy cast-iron shot propelled with low charges, on the ground that by the former method, a ship might be sunk or some vital part injured in much less time than would be required to destroy her by the American system.

On the Chalmers Target, by Capt. D. Galton, R.E.

The target may be understood by looking upon it as a beam in which the top flange is the front plate, the bottom flange a thinner plate behind, these two flanges being kept apart by means of a web of plates at right angles to the flanges. These

intermediate plates are supported laterally by layers of wood to prevent their breaking. The author stated that the results of the experiments made by the Iron Plate Committee had been most successful, and showed that the principle was correct.

The Marquis of LORN described the American vessel *Donderberg*, which he had seen, observing that it had a formidable ram, which was protected by armour-plates. The plates were five inches thick, and extended from the bottom to the top of the battering walls. The plates are not so well made as the turrets of the *Monitor* and *Washington*. There was only one fighting deck, and it was a broadside vessel.

General LEFROY maintained with regard to our floating defences, always reserving the controverted questions between turrets and broadsides, that they are the finest vessels in existence. As to our recent works of land defence—which the Chairman unhappily thought to have been constructed where nobody would attempt to land—they are objects of study and admiration to engineers from almost every country, and are not surpassed in design or execution by the fortifications of any country whatever. And with regard to our guns, Captain Noble had already established their superiority—except, indeed, that those present, who had heard the Chairman's address, would naturally suppose that it was the Americans who had adopted the powerful rifled gun, and the English who preferred the comparatively impotent smooth-bore. He assured the meeting that the reverse is the case, and that our guns do not exist on paper only; they enter into defences abroad, and the armament of ships at home. He further pointed out that the laminated structure of the turrets of the *Miantonomoh* had been tried and rejected in this country four years ago. In conclusion, he called attention to the tenacity with which erroneous ideas are maintained in this country when once adopted by influential persons, and pointed out that the doctrine of flat-fronted or punching projectiles, so completely refuted by the facts now placed before the meeting, was not that of professional men, but of eminent civil engineers, whose authority had maintained it until disproved by experiment, and he invited attention to specimens then in the exhibition.

Sir WILLIAM ARMSTRONG gave some particulars of the recent naval engagement at Lissa. He said he had no precise information as to the number and power of the guns used by the Italian fleet. He could state, however, that the Italians had been furnished from this country with rifled guns of the denomination of 150 and 300-pounders, but, unfortunately, on account of the pressure of public opinion in that country, the fleet first put to sea without taking those guns on board. So far as he was aware, the only guns in the fleet which were capable of making the slightest impression upon iron-plates were two 150-pounders on board the *Paletro*, which was blown up, and two 300-pounders on board the *Affondatore*. There was reason to believe that some of the shells fired from the two 150-pounders produced a very destructive effect on the Austrian ships. The 300-pounders on the *Affondatore* were unfortunately not completely fitted with carriages and other gear, and there was no ammunition on board suitable to fire against the timber ships of the Austrians. There was also an entire absence of previous exercise at the guns, so that there were only three or four rounds fired, and they exercised only an insignificant influence upon the action. All the rest of the Italian guns were cast-iron, and chiefly smooth-bore, the few rifled guns being only fired with low charges. The Austrian fleet, he believed, was armed in a similar manner. The paper of Captain Noble was the most complete and distinct exposition on the subject that had ever been submitted to the public, and he looked on it as a very valuable paper. The projectiles of large guns must necessarily be of great length, but he was convinced the shorter they could make them, consistently with accuracy, the greater power would be exerted on the target. Sir W. Armstrong then remarked upon the extreme ambiguity of the accounts that were published of trials which had been made of guns in foreign countries. They were not told whether the plates were solid or laminated, and whether they were backed or not. He expressed a preference for a large over a small bore, as there was greater volume for expansion and less crush upon the projectile when it struck. The great question in artillery experiments was the proper bore of the gun, and what guns would bear the heaviest charges of powder.

Colonel SYKES said there had never been a

greater waste of the public money than had been involved in the erection of the fortifications. To have them armour-plated would double the cost of their erection, and it would require the whole army of England to man one of them, which was thirty miles in extent. He would like to ask Captain Noble a momentous question—if any vessel could be made perfectly impenetrable to shot, consistent with its floatation?

Admiral Sir E. BELCHER pointed out the similarity between the armour-plating recommended by himself and the Chalmers's system, the former consisting of iron bars laid like those of a gridiron, which saved 1,780lbs. weight of iron in the square yard. He showed that it was as capable of resisting shot as the solid armour plates; and turning to another subject, he explained how vessels like the *Warrior* would have the effect of sinking vessels which ran into them. He was one of the old school, and thought that their vessels should be less armoured, so that the shot might pass clean through them.

Mr. FAIRBURN explained the difference between the construction of American and British ships, the former presenting as small a surface as possible above the water-line. He had advocated the system of protecting the ship above the water-line from the enemy's shot. They had yet to be informed of the best system of constructing the best sea-going armour-plated vessels. The American vessels are artificially ventilated through the turrets, and in other respects they were not calculated for long sea-voyages.

Captain NOBLE, in reply, stated that perhaps he had not been sufficiently explicit in his comparison between smooth-bore and rifled guns. The former was the American, the latter the English system. Shells might pass through a weak plate and burst among the crew. Chilled iron projectiles would also invariably break up against armour, and if the latter was not thick enough to prevent perforation, the chilled iron shot would be almost as bad as a shell. Thus a light description of armour might positively prove an element of weakness.

The PRESIDENT summed up, saying that he thought the time was come for having some result or definite principle, and yet they were still experimenting. First, they made a great gun which would penetrate the enemy's ship; then, when the enemy had adopted the gun, and could destroy our ships, it was found necessary to make a bigger ship, which could resist our own gun; and so on they went year after year spending millions of money, getting something exceedingly ponderous which would not answer the purpose required. What they wanted were a number of vessels of light draught carrying plenty of power on board, which could get round the enemy's large vessels like a number of hornets. He exposed the absurdity of placing their arsenals on shore occupied with all sorts of combustibles, which were within range of the enemy's fire, instead of placing them several miles inland. Adverting again to light vessels, he showed their essential importance in defending our West Indian towns, which in the event of a war with America would be an easy target for the enemy's vessels passing by at a distance of one or two miles.

MEETING FOR NEXT WEEK.

FRIDAY.

QUEKETT MICROSCOPICAL CLUB, 8, at University College.—"On Some of the Microscopic Effects of the Electric Spark," Mr. R. T. Lewis.

MISCELLANEA.

TROUBLE is in store for the British Association next year at Dundee. The Brechin Town Council have been asked to assist, but a Mr. P. Guthrie is of opinion that at the Nottingham Meeting this year the only thing they did was to propagate infidel principles. The Provost says that Bishop Forbes has prepared and published a letter, encouraging all parties to study, in order to be able to meet these opinions at the next meeting, when there will be a fair battle. Bailie Craig has no doubt the doctrines of the faith will be defended at the same time. This recalls the meeting of the Association in 1844 at York, when a paper was read entitled "Critical Remarks on Certain Passages of Dr. Buckland's *Bridgewater Treatise*," and published next day in the form of a sixpenny pamphlet, called "The Bible defended against the British Association:

being a Paper read in the Geological Section, at York, on the 27th of September, 1844, by William Cockburn, D.D., Dean of York." We recommend Messrs. Guthrie, Craig, and Co., before they imitate the Dean, to peruse carefully the crushing reply made by the veteran Sedgwick on that occasion.

A REPRINT of the original Kilmarnock edition, printed by John Wilson in 1786, of Burns' Poems is announced. The issue will extend to 600 copies only, of which 420 have already been subscribed for.

MESSRS. MOXON and Co. announce a Christmas Gift-book, Tennyson's "Elaine," illustrated by Gustave Doré. The book, an imperial quarto, will be printed by Mr. Swift at the Regent Press, from a new fount of type, cut for the purpose by Messrs. Stephenson and Blake, of Sheffield, and the paper will be manufactured specially by Messrs. Cowan and Sons.

FROM an article in the *Round Table* on "Philatelists," who are called "Philotelists" in this country, we gather that Messrs. J. B. Moens, of Brussels, and Mount Brown, of London, are the most successful as well as among the oldest and most prominent of collectors, though even their collections are not "complete;" whilst Dr. Gray, of the British Museum, and M. Maury, of Paris, rank next in reputation. Of American philatelists, the late James Leslie, of Ohio, Vice-Consul at Liverpool and Nice, was the possessor of a large and valuable collection. In general, the majority of collectors abroad are among the nobility and higher classes, and one of the Romish cardinals is earnestly engaged in the pursuit.

MESSRS. BLACKWOOD and SONS have in the press "The History of Scotland from Agricola's Invasion to the Revolution of 1688." By John Hill Burton, LL.D., Author of the "Book-Hunter," "The Scot Abroad," &c. In a lengthy prospectus, the author reminds us that "the vestiges of the early inhabitants of Scotland have been brought forth, arranged and classified so as to instruct us about the warfare and the social customs of those who inhabited the country before the opening of written history. Light has been contributed to this inquiry from those Scandinavian countries which were the cradle of the Scottish nation. Among these ancient remains, specimens of decorative art have been found so numerous and so peculiar, that eminent foreign critics have commented on them as forming a characteristic school of art national to Scotland. In co-operation with these investigations, the linguists and etymologists have been hard at work in identifying the several races by which the country was, from time to time, peopled. On the sojourn of the Romans in Scotland, the hints, often so obscure, which have dropped from classic authors, have been tested by vestiges of Roman inhabitation brought to light through laborious and costly searches. The remnants of the arts of the Middle Ages—especially the ecclesiastical and baronial buildings, of which Scotland is so full—have recently been examined by critical eyes, and adjusted to their proper place among the relics of art belonging to the European nations at large. They have thus been made to bear testimony to the periods in which they were built, and to give assistance in adjusting the chronology of historical events. The "History" will be comprised in six volumes, 8vo. Of these, four, bringing the narrative down to the abdication of Queen Mary, are now at press, and will be published in November.

DR. LANKESTER has put forth a sixpenny pamphlet on "Cholera," with a deep black border on the face of the canvas binding. We should have thought Dr. Lankester would have been above such quackery as this. A real physician does not try to make his prescriptions more alarming by writing them on black-edged paper. Dr. Lankester is clearly ignorant of one of the most important precepts of the modern pharmacopœia.

MESSRS. GROOMBRIDGE and SONS announce a new "Monthly" to commence on the first of October. The aim of *Christian Society* is "to present a quiet, pleasant *Literature of Christian Fellowship*, which, at the same time, shall be elevating and instructive."

MR. HENRY CHAWNER SHENTON, line engraver, died suddenly on Saturday evening. He fell in an apoplectic fit, and expired in less than half-an-hour. He was a pupil of Charles Warren's, and one of the last of that series of eminent engravers in the pure line style, which may be said to begin with Sir Robert Strange, and, continued by William Sharp, Charles Warren, James and Charles Heath, Richard Golding, Shenton, John Henry Robinson, Lumb

Stocks, George T. Doo, and other eminent men, has created the English school of this art, which takes a rank beside that of any other country. These observations apply to the engraving of figure subjects. Line engraving as a distinct art is, in the present day, ceasing in England, and is being supplanted by styles more easily executed and more mechanical, but not more beautiful. Of the series of line engravers named above, but very few remain, and as one by one drops off, the number is not recruited. The best of Mr. Shenton's larger works are probably those he did from Mulready's pictures; the most widely known are probably his later plates, engraved for the Art Union of London, the most notable of which was "The Death of Cœur de Lion," from John Cross's great picture in the C Committee Room of the House of Lords. Mr. Shenton was born in 1803, at Winchester, but his family was originally at Barwell, County Leicester. Latterly, owing to a failure in his sight, he was not able to practise his profession. He was a man of remarkable amiability, and devoted to his art.

In the second part of "Reading without Tears," which is well adapted for the purpose intended, the phonetic method is not entirely ignored, but no new letters are adopted to bewilder the learner.

THE Editor of the *New York Times* has complained to us of a quotation we made from the *Round Table*, a short time ago, to the effect that American ladies in respectable society were in the habit of drinking too freely, and that drunken women were not unfrequently seen in Broadway. A leading article in the former journal confesses that American women—many of whom "have more money than culture"—do "dress somewhat too showily in the street;" and suggests that the *Round Table*, judging "chiefly from dress and style, may have committed the blunder of taking some gay-spirited girl for—what she was not." We trust this is the true explanation of the matter. The position of women in the United States is so altogether a false one, that it is not to be wondered at if their failings are eagerly laid hold of by writers who wish to make the press a medium for social reform.

MR. WILKIE COLLINS' novel of "Armada" has just been dramatized in America by Miss Kate Reynolds.

QUITE a little scene took place at the meeting of the French Academy last Monday. The earthquake which was felt in Devonshire on the 14th, was a much more serious affair in France. M. Le Verrier arrived late, with a whole bundle of letters from country correspondents. The shocks were felt very sensibly at Paris in Rues Boileau and Molière. At Boulogne and Autueil beds were shaken and floors lifted up. So also at Créteil, Montretout, Ville d'Avry, Haut-Sèvres, Surresnes, Verres, Brunoy, Mongeron, and other places. The shocks were very strong at Tours, Limoges, Nantes, Angers, Angoulême, &c. The oscillation which was occasioned by the two successive shocks might be indicated on a map by a polygon embracing Rouen, Paris, the Department of the Saône-et-Loire, Tours, Perigueux, La Rochelle, Nantes, and Chartres. Such a map had already been prepared by M. Le Verrier. He considered that the more speedily it was made out, the more accurate it would be. As soon as the event was generally known, people in all quarters would pretend to have observed it.

MR. ALFRED TENNYSON is, we hear, engaged on a new poem, to be published early next year.

HERD'S Chronicle of Four Reigns—two copies only of which exist—is about to be printed for the Roxburghe Club, by Mr. S. Watson Taylor. The owner of the MS. is Sir Thomas Warrington, M.P.

THE Bookseller, the monthly representative of the trade, in its last issue, made a serious charge against the author of the work entitled "Familiar Words," accusing him of wholesale plagiarism from an American volume published at Boston. The compiler of "Familiar Words" has replied by printed circular, denying the charges brought against him. The quarrel is one in which we cannot interfere.

THE Editor of the *Public School Latin Primer* has at length condescended to reply to one at least of his numerous censors—viz., Mr. Roby. In a long letter in the *Times* of last Thursday, he defends his work, and expresses a belief that the new Grammar will swallow up all the "rods" which have preceded it.

"THE Bible of Every Land" is a publication which professes to be in "strict conformity with the latest discoveries in Ethnology." It is difficult to gather from the prospectus exactly what the plan of the book is. We are told the great

object is that of "displaying the history of the Holy Scriptures," but this is not to be inconsistent with reviewing "the origin and condition of the nations to which special versions have been given." Portions of the Bible would provide capital texts for ethnological lectures, and we are curious to see this latest effort to reconcile Science and Scripture.

THE funeral of Mr. Edward Tinsley, who died at the early age of 31, took place on Wednesday afternoon. Many literary men attended on the occasion.

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THE READER.

22 SEPTEMBER, 1866.

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